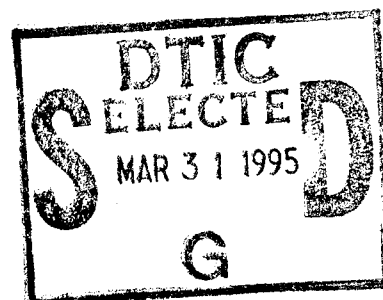# NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA

THESIS

APPLICATION OF THE WENGER TAXONOMY
FOR CLASSIFYING GOODS PURCHASED BY
THE FEDERAL GOVERNMENT TO
MARKET RESEARCH

by

John F. Lynn

December, 1994

Principal Advisor: David V. Lamm

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Recent research efforts have examined the concept of contracting as a science. The Wenger Taxonomy study proposed a classification schema for goods procured by the Federal Government. Subsequent research studies validated the Wenger classification schema and suggested potential improvements to the model and applications to the field of contracting. An important criterion for any classification scheme is its usefulness and as such, this thesis examines the potential useful application of the Wenger taxonomy to market research. The study focuses on application to market research from the Government buyer's perspective. It analyzes application in the area of measuring buyer level of knowledge about goods procured and it also proposes a market research model for a specified set of characteristics from the Wenger model. Potential structural deficiencies in the model are discussed as well.

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MARKET RESEARCH

by

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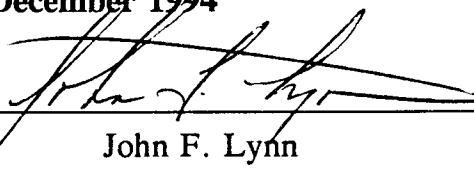
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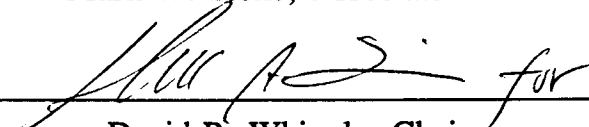
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ABSTRACT

Recent research efforts have examined the concept of contracting as a science. The Wenger Taxonomy study proposed a classification schema for goods procured by the Federal Government. Subsequent research studies validated the Wenger classification schema and suggested potential improvements to the model and applications to the field of contracting. An important criterion for any classification scheme is its usefulness and as such, this thesis examines the potential useful application of the Wenger taxonomy to market research. The study focuses on application to market research from the Government buyer's perspective. It analyzes application in the area of measuring buyer level of knowledge about goods procured and it also proposes a market research model for a specified set of characteristics from the Wenger model. Potential structural deficiencies in the model are discussed as well.

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I. INTRODUCTION

A. BACKGROUND

Recent research efforts have proposed the concept of contracting as a science. As with any science, the concept began with the description and classification of the subject matter. One of the first studies to explore the notion of contracting as a science was conducted by Lieutenant Brian Wenger, SC, USN, in 1990. He began by proposing a schema for classifying all goods procured by the Federal Government according to their inherent characteristics. His research effort also identified potential applications of his taxonomical structure to areas of contracting tasks. Wenger's study was subsequently validated and expanded upon by several other researchers who proposed other useful applications of his taxonomy.

One of the areas identified as having potential application of the taxonomy was market research. Market Research is an element of the acquisition planning process which has been cited as a weakness in the field of Government contracting. As a result of this weakness, the 1984 Competition in Contracting Act (CICA) legislated the requirement to conduct market research early in the planning phase of a procurement. There are two issues which arise from the statute. First, it is not clear what the scope of the market research should be. Secondly, what are the tools the acquisition workforce needs in order to fulfill the mandate?

The need for more effective market research in Government procurement has been documented in numerous reports and commissions from the Packard Commission to the Section 800 Advisory Panel. The CICA, as well as these reports and panels have not adequately defined effective market research, nor how to conduct it in an organized, systematic manner. There is still a considerable amount of confusion and lack of

understanding as to what constitutes market research and how to conduct it. (Mulhern, 1991, pp. 23-24)

A taxonomical structure for classifying goods would enhance market research because it would serve as a scientific framework for: conducting organized and systematic research of the overall market; revealing trends in the market; identify ways to improve the procurement process; and, advancing the body of market research knowledge.

Application of the taxonomical structure of classifying goods to the area of market research should enhance the scope and depth of the market research effort. Additionally, an organized and methodical approach will enable the acquisition workforce to perform more effective market research.

B. OBJECTIVES

The primary objective of this study is to determine application of the taxonomy to the market research function for goods purchased by the Federal Government. Specific objectives of the study are to:

1. Identify how the taxonomy can be applied in order to improve the conduct of market research in Federal Government procurement.

2. Examine the most promising areas where the taxonomy can be applied in market research.

3. Examine ways in which implementation of the taxonomy can improve the market research function of Federal Government buyers.

4. Validate the application of the taxonomy to market research identified in previous studies.

C. RESEARCH QUESTIONS

The following research questions served as the focus of this study:

Primary Research Question:

To what extent can the Wenger Taxonomical Model for classifying goods purchased by the Federal Government be applied to the market research function?

Subsidiary Research Questions:

1. What is the most effective application of the taxonomical model to the market research function?

2. How can the taxonomy be used to improve the buyer level of knowledge about the goods for which they are responsible for procuring?

3. What market research techniques are essential for conducting effective market research given a good with a certain set of characteristics?

4. What are the structural deficiencies of the Wenger Taxonomy that impede application to market research?

D. RESEARCH METHODOLOGY

The research conducted in support of this study involved an extensive literature review, data collection via a survey, and telephone interviews conducted with supervisors of the buying offices surveyed and with recognized experts in the field of contracting.

The research effort began with a comprehensive literature review of the areas of taxonomy and classification. The goals were to develop the theoretical framework or the "how" and "why" of taxonomies and to examine previous literature proposing application of taxonomies to contracting. The literature review also focused on the issue of market research in the Federal Government and what difficulties are being

encountered in performing market research. The literature review also examined the applicable laws and previous research efforts in the area of market research in the Federal Government procurement arena.

After developing the theoretical understanding of taxonomies, selection of the buying offices and goods to be included in the survey was conducted. The researcher elected to examine a single application of the taxonomy in conjunction with a single category of goods as recommended by Sheehan. (Sheehan, 1992, p.101) Specifically, the researcher selected the H-60 helicopter and its associated parts and components.

The activities chosen for survey were the activities with assigned responsibility for support of the H-60 helicopter in the Army, Navy, and Coast Guard. The activities selected were: the U.S. Army Aviation Troop Command (ATCOM), St, Louis, Missouri; the U.S. Navy Aviation Supply Office (ASO), Philadelphia, Pennsylvania; and, the U.S. Coast Guard Aircraft Repair and Supply Center (ARSC), Elizabeth City, North Carolina. The goods used in the survey were commonly purchased by all participating activities.

Upon receipt of the data, analysis was conducted using limited statistical and qualitative analysis of the narrative responses. The results are discussed in Chapter IV.

After analysis of the data, telephone interviews were conducted with supervisors of the buying activities and seven experts in the field of contracting who had participated in the previous taxonomy studies of Wenger and Prendergast. Telephone interviews were conducted to discuss additional applications not uncovered by the researcher and to discuss results of the survey information.

E. SCOPE, LIMITATIONS, AND ASSUMPTIONS

The scope of the research is limited to examining the application of the Wenger Taxonomical Structure to the area of

market research. The study also examines structural problems with both the taxonomy and the buying organizations, associated with applying the taxonomy to market research by the Federal workforce.

The following assumptions apply:

1.   The previously developed six characteristics identified by Wenger and validated by Prendergast are the best qualified for classifying goods.

2.   The buyers in the buying offices surveyed had sufficient knowledge about the goods they procure in order to classify them and apply the taxonomy for purposes of market research.

3.   All of the goods procured by the Federal Government could be classified according to the Wenger Taxonomy.

4.   The buyers could apply the taxonomy to market research activity without having to be educated in the basic precepts of the taxonomy.

The following limitations apply:

1.   Only a single application, that being market research, and a single category of goods, those being goods associated with the H-60 helicopter, would be examined in this study.

2.   A small sample population of 29 buyers participated in the survey.

3.   The buying offices participating in the survey were not educated in the concept of taxonomy nor its underlying scientific precepts.

F. LITERATURE REVIEW

The model upon which this study is based is the graduate thesis, "A Taxonomical Structure for Classifying Goods Purchased by the Federal Government," (1990) by Lieutenant Brian Wenger, SC, USN. His research provided the basic structure for the study as well as basic theory on classification.

Two other graduate theses proved invaluable in the conduct of this study. The first, "Application of a Taxonomical Structure for Classifying Goods Procured by the Federal Government," (1991) by LCDR John Prendergast, SC, USN, was another valuable source helpful to understanding the mechanics and theory of the taxonomy. "A Taxonomy of Goods Procured by the Federal Government: Applications and Benefits," (1992) by Lieutenant Edward Sheehan, SC, USN, also proved useful in helping the researcher to focus the study on one application of the taxonomy, that being market research.

Dr. Harold Fearon's book, <u>Purchasing Research: Concepts and Current Practice</u> and the unpublished text, <u>"Policy Guidance on Market Research for Contracting Officers"</u> by Dr. John J. Mulhern provided substantial background in the area of market research. Additionally, the graduate thesis, "Commercial Style Market Research for Navy Activities," (1993) by Lieutenant Elliot C. Yoder, SC, USN, was also helpful in framing this research.

G. ORGANIZATION OF STUDY

This study was developed to further explore the application of the Wenger Taxonomy to the market research function and to examine its potential for improving the conduct of market research by Federal Government buyers. Chapter I presented the research objectives, questions, methodology, assumptions and limitations, and literature review.

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In Chapter II, a review of the definitions and basic principles of classification are presented. The previous research efforts of Wenger and Prendergast are reviewed as well as their major findings.

Chapter III is an examination of the concept of market research. Definitions of market research, purchasing research, and marketing research are compared and discussed. Confusion resulting from the varying definitions and the intent of the Competition in Contracting Act of 1984 is examined also.

Chapter IV presents the data gathered from the 29 survey respondents in the buying offices. Additional information gathered from interviews conducted with supervisors and experts in the field of contracting is presented as well.

Analysis of the survey responses and interviews is presented in Chapter V. Chapter V also discusses potential applications of the taxonomy to the area of market research.

In Chapter VI, the conclusions, recommendations, answers to the research questions, and recommended areas for further research are presented.

II. THEORETICAL FRAMEWORK

A. PURPOSE

The purpose of this chapter is to introduce the concept of classification, explore how classification schemes are utilized, and to develop an understanding of the use of the taxonomic structures in both the physical and social sciences as well as in procurement research. The focus of this section is to:

1. Examine the science of taxonomy, including its definitions, philosophy, and techniques;

2. Outline the uses of taxonomy in research conducted in the field of procurement; and

3. Review the previous research conducted in the taxonomy of goods procured by the Federal Government, and the results of those research efforts.

B. INTRODUCTION

One of the most potentially significant concepts recently proposed in the field of Government contracting is the notion that contracting is a science. The field of contracting has become substantially more complex in recent years. The number of laws, regulations and directives used in procurement, as well as the technical complexities of the items being purchased have expanded dramatically. The potentially enormous costs of contracting errors in both dollar terms and the public's level of confidence demand that buyers understand what they are purchasing. (Sheehan, 1992, p. 10) Additionally, Government procurement also serves as an instrument of foreign policy through Foreign Military Sales (FMS), social policy through socio-economic programs, and fiscal policy through fluctuations in Government spending levels. (Sheehan, 1992, p. 10) This concept of contracting as a science arose as a direct result of the growing

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complexity and increasing difficulties encountered in the procurement process.

The concept of contracting as a science implies that a systematic and organized approach can be employed for the development and validation of contracting knowledge. (Park, 1986, pp. 12-13) If contracting is indeed a science as has been postulated, then it must meet the following substantive characteristics defined by Steven Park (Park, 1986, p. 41):

1. A distinctive subject matter.

2. The description and classification of the subject matter.

3. The presumption of underlying uniformities and regularities concerning the subject matter.

4. The adoption of the method of science for studying the subject matter.

It is the second scientific characteristic that has been the focus of previous classification studies conducted in contracting to date. The classification studies conducted in the field of Government contracting have been a continuation of the concept of contracting as science. (Prendergast, 1991, p. 9) Taxonomies of procurement literature, contracting officer tasking and procurement tasks, and a model for classification of goods purchased have all been developed.

C. DEFINITION OF TERMS

For purposes of this study, the following basic taxonomic definitions apply (Fleishman and Quaintance, 1984, p. 22):

- Taxonomy - The theoretical study of systemic classifications including their bases, principles, procedures and rules. The science of how to classify and identify.

- Classificatory System - The end result of the process of classification, generally a set of categories or taxa.

- Classification - The ordering or arrangement of entities into groups or sets on the basis of their relationships, based on observable or inferred properties.

- Identification - The allocation or assignment of additional, unidentified objects to the correct class, once such classes have been established by prior identification.

- Taxon (plural: Taxa) - A group or category in a classification system resulting from explicit methodology.

D.   PRINCIPLES OF CLASSIFICATION

All classificatory systems involve partitioning some set of objects or events into categories that are homogeneous with respect to the selected characteristics.   However, there are two approaches for generating classification schemata, which in turn impact the applications for which the they may be used.   The two procedures are logical partitioning and grouping. (Hunt, 1983, p. 349)

The first scheme, logical partitioning, often referred to as deductive or *a priori* classification, involves the development of the scheme before any data are analyzed. This type of procedure imposes a classificational system on the data to be analyzed. It starts with specification of the phenomena to be categorized (e.g., goods or services), followed by delineation of the categorical terms, which are the properties or characteristics on which the classification schema is to be based (e.g., unit cost, complexity). Finally, the various categories that emerge from applying the categorical terms to the phenomena are labeled. (Hunt, 1983, pp. 349-350)

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Logical partitioning results in monothetic classifications where all members of a category possess all of the characteristics or properties used to identify the category. It may also result in empty categories or a category to which no phenomena belong. Additionally, it presupposes a comprehensive understanding of the phenomena under investigation. (Hunt, 1983, pp. 351)

The second scheme, grouping, which is sometimes referred to as inductive, *ex post*, or quantitative classification, starts with the specification of the phenomena to be classified. With grouping, the classification scheme is produced after the set of data has been analyzed. Grouping procedures, like logical partitioning, start with specification of the phenomena to be classified and the properties or characteristics on which the categorizing is to be done. However, unlike logical partitioning, grouping procedures determine categories after, and as a result of, analysis of specific set of data. (Hunt, 1983, pp. 349-350)

Grouping procedures normally result in polythetic classifications where the phenomena in any class may share many characteristics in common, however, no individual phenomena need possess all of the characteristics of the class. Grouping procedures, unlike logical partitioning, do not result in empty categories since the categories are formed from existing observations. (Hunt, 1983, p. 354)

There are several implications of the two different approaches to classification which suggest that grouping procedures, as employed in the Wenger model (Wenger, 1990), are appropriate for the taxonomy of goods purchased by the Federal Government. First, given the diversity of goods procured by the Federal Government, logical partitioning would result in either too many categories, or categories based on no more than two or three characteristics, neither of which would be useful. (Sheehan, 1992, p. 14) Secondly, grouping

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procedures are better able to handle large numbers of categorical properties. (Hunt, 1983, p. 355) Finally, grouping procedures require substantially less a priori knowledge concerning which specific properties are likely to be powerful for classifying phenomena than does logical partitioning. (Hunt, 1983, p. 355)

E. EVALUATION CRITERIA

In evaluating alternative classification schemes, several criteria have been suggested (Hunt, 1983, p. 355):

1. The classification scheme should adequately specify the phenomena to be classified.

2. The scheme should adequately delineate the characteristics used in classifying.

3. The scheme's categories should be mutually exclusive. (e.g., the item should fit into only one category)

4. The scheme's categories should be collectively exhaustive. (e.g., every item is put into a category. A large number of items in a miscellaneous grouping indicates a flawed system)

5. The classification scheme must be useful.

6. The system should be internally homogeneous. (e.g., the items within the categories should be separate and distinct from items in other categories.)
(Wenger, 1990, p. 15)

The first criterion inquires as to whether the scheme adequately specifies the phenomena to be classified. The answer is not always obvious. A classification of goods may actually only classify the researcher's perceptions. (Hunt, 1983, p. 356)

The second criterion suggests that characteristics should meet the test of differentiation of the objects, be relevant to the end-use goal, ascertainable to the researcher, and consistently applied. (Wenger, 1990, p. 15)

Mutual exclusivity states that an object to be classified can only fit into one category. No item may be placed in two different categories simultaneously.

The fourth criterion suggests that every item to be classified should fall into one of the categories.

The fifth criterion may arguably be the most important. How useful is the scheme for helping solve problems or make decisions? How much utility will practitioners gain from applying the classification? A classification scheme must be clearly understood and in order to be valid, its applications or uses must also be understood and validated. This research effort will attempt to demonstrate the usefulness of the Wenger model as it pertains to market research.

F. TAXONOMIC APPLICATIONS IN PROCUREMENT

As noted previously in this chapter, there has been a moderate amount of research conducted into the classification of different aspects of procurement. In 1986, Steven Park proposed the concept of contracting as a science along with the recommendation for a classification scheme. (Park, 1986, p. 12) Clark Fowler followed up that effort by exploring the taxonomic structure of procurement tasks. (Fowler, 1987) Furthermore, in 1987, Asa H. Page developed a classification of contracting officer taskings. (Page, 1987) Additionally, Richard Sweeney conducted classification analyses of available procurement literature in 1989. (Sweeney, 1989)

1. The Need for a Classification of Goods

Despite the efforts of the aforementioned researchers, there was still a lack of knowledge pertaining to a classification of goods procured by the Federal Government. As mentioned earlier, the increasing complexity and frequency of problems in the Government buying process indicated a need to develop a body of knowledge founded in scientific principles. It appeared that significant benefit could be

derived from clustering individual goods into groups based on considerations deemed important to the contracting process. (Lamm and Wenger, 1990, p. 1)

A significant problem in today's procurement environment, which reinforces the need for a classification of goods, was succinctly stated by Robert Judson when he said;

> Often, critics of the acquisition process incorrectly assume that the characteristics of purchasing ordinary consumer goods can be readily transferred to the acquisition of unique items. (Judson, 1986, pp. 14-15)

Judson's observation was reiterated by Lamm and Wenger when they stated that when additional oversight is mandated, little thought is given to the differences in product complexity or procurement processes involved. (Lamm and Wenger, 1990, p. 2)

2. General Benefits of a Strategic Classification

The following benefits could be realized by a classification scheme for procuring goods by the Federal Government (Prendergast, 1991, p. 22):

1. Better understanding of the relationships between goods.

2. Segregation of goods within commodity type.

3. Differences in complexity or procurement procedures would be recognized in formulating regulations and policy.

4. Accurate determination of acquisition strategies.

5. Application in the logical budgeting of operating funds to contracting activities based on inherent characteristics of the item, vice other less descriptive measures such as unit price.

G. CLASSIFICATION OF GOODS

To date, there has only been a minimal amount of literature available on the subject of taxonomy of goods. Most of the work has been focused in the field of marketing. This next section briefly examines the current classification schemes in use in the Federal Government as well as classification initiatives in business marketing. The discussion in these areas provides a theoretical framework for discussion of the Wenger model.

1. Government Classification Schemes

There are presently two widely recognized classification schemes utilized by the Federal Government. They are the Federal Supply Classification (FSC) and the Standard Industrial Classification (SIC).

The FSC classification categorizes goods within a commodity group. Groups and classes have been established with an emphasis on those items already known to be in the Federal supply system. The primary classification basis is the physical or performance characteristics of the good. Items that are normally requisitioned or issued together or constitute a related grouping for supply management purposes are grouped in the same class. (<u>Federal Supply Classification Handbook H2-1</u>, 1989, p. ii) Any strategic insights that may be gained through the FSC would benefit supply/logistics management rather than procurement.

The second classification scheme, the Standard Industrial Classification (SIC), is organized to reflect the structure of the U.S. economy. The basis of the classification is the business establishment. Placement is based on the establishment's primary activity, which is determined by identifying the predominant product or group of products produced or handled by the establishment. The purpose of this scheme is to provide a system of data collection, tabulation

and presentation of statistical data relating to business establishments in the U.S. (<u>Federal Supply Classification Cataloging Handbook H2-1</u>, 1989, p. 4)

While both of these systems serve a useful purpose in their own right, they do not satisfy the need for a strategic classification of goods procured by the Federal Government. Neither provides insight into the Government procurement process. (Lamm and Wenger, 1990, p. 240)

2. Classification Schemes in Marketing

The need for a system of classification has long been recognized in the field of marketing. Much can be learned from the experience of those in marketing when considering the application of a taxonomy of goods to the discipline of contracting. There has been a recognition that: "An observable relationship exists between the characteristics of a product and the approximate marketing mix for that product." (Miracle, 1965, p. 19) By extension it is possible to see a corollary in the procurement process, and the research done in classifying goods for marketing purposes are very applicable here. (Prendergast, 1991, p. 25)

The field of marketing appears to be many years ahead of contracting in its effort to frame the discipline as a science. Marketing theory has a longstanding tradition of classifying goods and services. Beyond marketing's precedence both in seeking recognition as a science and developing taxonomies in pursuit of that recognition, the field of marketing has benefitted from the application of classification schemes. (Sheehan, 1992, p. 18) Marketing recognized early that the ultimate criterion of a taxonomy is its usefulness or utility in assisting managers in decision-making. (Hunt, 1983, p. 360)

There are several classification schemes in use in marketing. Among them are classification schemes for different kinds of goods (e.g., convenience, shopping), stores

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(e.g., department stores, specialty line stores), wholesalers (e.g., general merchandise, general line), and pricing policies (e.g., demand oriented, cost-plus). (Hunt, 1983, p. 348) These classification schemes guide strategic management decisions with respect to the appropriate marketing mix for the given entity. (Sheehan, 1992, p. 19) The marketing mix serves the marketing management process by linking the four basic marketing elements, often referred to as the four "Ps," product, price, promotion and place(distribution channel), to the target market.

The product policy involves the determination of the number of variations in the products to be offered, including product homogeneity and heterogeneity. Pricing policy pertains to the degree to which a firm has control over the price of the product. Promotional policy includes decisions as to how the advertising or selling aspect will be packaged. Distribution or channel policy entails decisions with regard to type and number of distributors to use. (Miracle, 1965, pp. 21-22)

Marketing classification schemes generally link the elements of the marketing mix with categories within the classification scheme. Classification schemes provide marketing managers with general guidelines for the appropriate marketing mix. They help predict a product, price, promotion, and distribution strategy for success. Based on the category in which a product belongs, the classification scheme suggests an optimal marketing mix. The classification scheme can also provide insight in which elements should be adjusted in order to reposition the product into another category, which may be more profitable or compatible with the firm's goals. (Sheehan, 1992, p. 20) The purpose of any product classification scheme is to guide managerial decision making. A comprehensive marketing strategy should be based upon product characteristics. (Murphy and Enis, 1986, p. 35)

Gordon Miracle proposed a product classification scheme based on the product's characteristics as a basis for making the connection between product attributes and marketing strategy. (Miracle, 1965) This scheme, which served as the basis for the Wenger model deserves close attention at this juncture.

As noted earlier, Miracle's classification scheme links product characteristics and the marketing strategy. The premise of Miracle's scheme is that an observable relationship exists between the product's characteristics and the marketing mix. (Miracle, 1965, p. 19)

In his discussion of product characteristics, Miracle proposes that a product is defined as the sum of the physical and psychological satisfactions the buyer receives from the purchase of the product. It can be thought of as a bundle of utilities. Miracle suggests that product characteristics incorporate what may be thought of as consumer characteristics or market characteristics. For example:

> The amount of time and effort spent in purchasing a product may seem to be a consumer characteristic. But if convenience of location is part of the bundle of utilities and hence part of the total product for which the consumer pays, it seems reasonable that the short length of time the consumer spends searching for a place to buy a pack of cigarettes is a characteristic of the product. The convenience is provided as one feature in the bundle of utilities. Another way of stating this point is that the nature of the product determines how much time (or what kinds of effort) consumers will wish to spend in buying the product. Thus, consumer and market characteristics may be described in terms of product characteristics. (Miracle, 1965, p. 19-20)

The important point to gain from this quote, is that the characteristics deemed important in the marketing process can be incorporated into product classification schemes. Similarly, the same logic holds true for characteristics

deemed important in the Federal procurement process. (Sheehan, 1992, p. 22)

Miracle set forth a number of characteristics that he felt would allow for the logical grouping of commodities. His classification scheme utilizes the nine product characteristics listed in Figure 2-1.

1. Unit value
2. Significance of each individual purchase to the consumer
3. Time and effort spent purchasing by consumers
4. Rate of technological change (Including fashion changes)
5. Technical complexity
6. Consumer need for service (before, during, and after the sale)
7. Frequency of purchase
8. Rapidity of consumption
9. Extent of usage (number and variety of consumers and variety of ways in which the product provides utility)

(Miracle, 1965, p. 20)

Figure 2-1
Product Characteristics

Miracle then placed all products into five groups using a subjective ranking of the individual's attributes based on the classification characteristics listed above. Figure 2-2 provides the subjective product characteristics of the five groups. For instance, candy bars would be very low in unit value or rate of technological change, while very high. in rapidity of consumption. Similarly, steam turbines would be very high in unit value, and very low in frequency of purchase.

Product Charact.	Group I	Group II	Group III	Group IV	Group V
1.	Very low	Low	Med to High	High	Very high
2.	Very low	Low	Medium	High	Very high
3.	Very low	Low	Medium	High	Very high
4.	Very low	Low	Medium	High	Very high
5.	Very low	Low	Med to High	High	Very high
6.	Very low	Low	Medium	High	Very high
7.	Very high	Med to High	Low	Low	Very low
8.	Very high	Med to	Low	Low	Very low
9.	Very high	High	Med to High	Low to Medium	Very low

(Miracle, 1965, p. 20)

Figure 2-2
Product Characteristics by Group

Individual products are subjectively assigned values for each of the nine characteristics. Depending on the value assigned to the product's characteristics, the good is placed in one of five categories, ranging from one extreme to the other. Examples of the items from the five groups are presented in Figure 2-3:

Miracle acknowledged a shortcoming of this scheme and stated that it is an artificiality to classify products by groups, and that it would be more accurate to place products on a continuum ranging from one extreme to another. It should also be noted that a product may not always remain in the same category. For instance, a product may initially fall into a certain category, then, as consumers accept the product, time and effort spent in purchasing the product is reduced, or as other characteristics change, the product may move into another category. If a manager is aware of this process, an effort can be made to differentiate or modify a characteristic to move the product back to its original category, or another,

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Group I	Candy bars, cigarettes, soft drinks, and razor blades
Group II	Small hardware items, proprietary pharmaceuticals, industrial operating supplies, and dry groceries
Group III	Radios, television sets, tires, major appliances, women's suits, and athletic equipment
Group IV	Farm machinery, automobiles, quality household furniture
Group V	Steam turbines, electrical generators, electronic office equipment, and specialized machine tools (Prendergast, 1991, p. 26)

Figure 2-3
Product Classification Groups

if desired. (Miracle, 1965, p. 21)

The classification scheme can be used to predict the nature of the marketing mix that would be suitable for a given product. As an example, Miracle provides that the marketing mix for a product in Group I should be as follows (Miracle, 1965, p. 23):

1. Relatively little effort and money spent on product development. Since a standard variety of the product is suitable for a broad group of consumers, there is relatively less need for frequent change than for products in other groups.

2. Considerable effort spent in achieving intensive distribution. Products must be available quickly and conveniently.

3. Heavy consumer advertising--little or no personal selling. Consumers typically are pre-sold by advertising.

4. Relatively little effort and time spent on pricing. Firms have little control over price; variations in price are relatively infrequent; prices are not negotiated between seller and consumer.

In contrast to the above, products in Group V are normally (Miracle, 1965, p. 24):

1. Custom built.

2. Sold directly from manufacturer to user.

3. Sold primarily by salesmen, rather than advertising.

4. Sold on the basis of an individually negotiated price.

Despite the acknowledged shortcomings of the Miracle classification scheme, it has proven extremely useful in marketing. (Sheehan, 1992, p. 25) Miracle's classification scheme demonstrates how a taxonomy can provide strategic insight and predict policy decisions. The lessons from marketing, which can be extrapolated to the contracting field, suggest that a taxonomy of goods could serve to advance many aspects of contracting. (Sheehan, 1992, p. 26)

H. WENGER TAXONOMICAL MODEL

The Wenger taxonomical model has its roots in the work of Miracle described in the preceding section. The premise for the classification scheme was to classify Government goods in a way that offers strategic insight into the buying process. The goal was to create a classification scheme that would highlight the various categories of goods and their related characteristics to allow streamlining and tailoring of contracting policies, methodology, and procedures. (Wenger, 1990, p. 25)

1. Development of the Model

Drawing on the characteristics proposed by Miracle and several additional ones proposed by Robert Judson (Judson, 1986, p. 14), Wenger developed a preliminary list of 22 characteristics of goods procured by the Federal Government. The 22 preliminary characteristics are listed in Figure 2-4.

1. Unit Value.
2. Significance of each individual purchase to the Government.
3. Time and effort spent purchasing by the buyer.
4. Rate of technological change.
5. Technical complexity.
6. Need for service (before, during, or after sale).
7. Frequency of purchase.
8. Rapidity of consumption.
9. Extent of usage (number and variety of users and variety of ways in which the good provides utility).
10. Amount of price negotiation.
11. Alternative sources availability.
12. Degree of contractor financing available.
13. Amount of product homogeneity.
14. Factors considered by the buyer (price, quality, availability, and technology).
15. What determines price.
16. Amount of choice available to the buyer.
17. Stability of requirements.
18. Amount of short-range versus long-range planning.
19. Usage-planned and useful consumption, or acquired as "insurance" (e.g., major weapon system).
20. Extent to which goods are customized.
21. Extent to which buyer exercises judgement in meeting needs of requiring activity.
22. What is nature of the demand for the good.
    (Wenger, 1990, p. 27)

Figure 2-4
Preliminary Goods Characteristics

The characteristics were then refined with the assistance of an expert panel of 12 National Contract Management Association (NCMA) Fellows. Based upon their input, the list of 22 preliminary characteristics was refined to 12 characteristics describing Government goods from a strategic viewpoint. (Lamm and Wenger, 1991, p. 241) The characteristics were then defined and scaled from one to five to allow comparisons between a particular good and the characteristics. (Lamm and Wenger, 1991, p. 241) The revised list of 12 characteristics is shown as Figure 2-5.

1.   Change
2.   Complexity
3.   Customization
4.   Maintainability
5.   Homogeneity
6.   Consumption
7.   Unit Cost
8.   Documentation
9.   Item Attention
10. Sources
11. Criticality
12. Stability
     (Lamm and Wenger, 1990, p. 3)

Figure 2-5
Revised Goods Characteristics

The next phase of the model's development involved classifying a sample group of 21 different commodities based on the twelve characteristics. The 21 sampled goods are listed in Figure 2-6. Wenger then surveyed 139 NCMA Fellows to assess the relationship between the 12 characteristics and the 21 sample goods.

The survey responses were then analyzed using cluster analysis, and the 21 goods were divided into five discrete clusters of relatively similar objects within the clusters. Examination of the cluster analysis indicated that six of the characteristics could be eliminated.

> Along with an examination of the range of mean values for each of the 12 attributes, cluster analysis signalled the possible elimination of six attributes. While those attributes eliminated could describe the goods, their relative consistency across the various groups added little to the distinction between the goods. Because their consideration did not essentially add to the differentiation between clusters, retaining them merely caused a burden to the classification scoring process. (Lamm and Wenger, 1991, p. 244)

```
1.    General Office Microcomputers
2.    Fork Lift Trucks
3.    Guided Missiles
4.    Electronic Countermeasure Equipment
5.    Paper Towel Dispenser
6.    Pneumatic Chisel
7.    Floating Drydock
8.    16MM Film Projector
9.    Cold Food Counter
10.   Submarine Periscopes
11.   Filing Cabinet
12.   Sandpaper
13.   Aircraft Fire-Control Embedded Computer
14.   Bottled Salad Dressing
15.   Nuclear Reactors
16.   Semi-conductor Assembly
17.   Shipboard Washing Machine
18.   Fluorescent Light Tubes
19.   Pneumatic Tire (Non-aircraft)
20.   Micrometer (General purpose)
21.   Flat Washers
      (Wenger, 1990, p. 44)
```

Figure 2-6
Wenger's Commodities Sampled

For a more thorough discussion of cluster analysis and its uses in taxonomical structures, see Wenger, 1990, or H. Charles Romesburg's, <u>Cluster Analysis for Researchers</u>, 1984.

The six characteristics which were retained as a result of the cluster analysis are:

1. Complexity
2. Customization
3. Maintainability
4. Unit Cost
5. Documentation
6. Item Attention

In an effort to place goods along a continuum from simple to complex, a grid was developed to reflect the placement of a good within a category. Each grid allows for scoring within categories from simple to complex, based on an aggregate of the classifier's inputs. A "+" was used to symbolize a score

that fell near the upper end of a category, a "0" near the middle, and "-" near the lower end. (Lamm and Wenger, 1991, p. 246) Wenger's taxonomy resulted in five categories of goods reflecting relatively different characteristics between categories. The categories were labeled simple, basic, moderate, advanced, and complex. (Wenger, 1990, p. 87)

2. Validation of the Wenger Model

A subsequent study was conducted by Jack Prendergast in 1991 (Prendergast, 1991) to validate the Wenger model. As recommended by Wenger, Prendergast applied the model to buying organizations within the Department of Defense. Rather than surveying NCMA Fellows, Prendergast surveyed buyers of the goods within the Aviation Supply Office (ASO) in Philadelphia, Pennsylvania, and the Defense General Supply Center (DGSC) in Richmond, Virginia. ASO and DGSC were selected as survey sites due to their large population of buyers and their diverse group of goods purchased. (Prendergast, 1991, p. 33)

Prendergast utilized the following guidelines in selecting the items to be classified (Prendergast, 1991, p. 37):

> 1. The items would need to be fairly recognizable. Since the sole identifier for the respondent was nomenclature, the aim was to select items that would have name recognition for even the most casual observer.
>
> 2. The items chosen would be of an equipment nature vice a piece part nature. Again due to the use of nomenclature to identify the item to the buyers, it was felt that an item on the equipment level would be less likely to generate confusion. For instance, a propeller for the P-3 Orion aircraft would be more recognizable than a capacitor, which could come in a wide variety of sizes, shapes, and capacities.
>
> 3. The items to be surveyed would be part of a homogeneous grouping, based on the organization of the activity selected.

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4. The descriptions of the items to be classified were to be purposely generic to avoid creating an a priori bias in the way that the survey was presented.

Due to differences in the buying organizations' structures, (ASO assigned buying responsibilities by end item application, while DGSC assigned workload by commodity), the items selected for classification at ASO were from the P-3 *Orion* aircraft. These goods are listed in Figure 2-7. The goods classified at DGSC, from the Food Service Equipment group and the Ship and Marine Equipment group are listed in Figures 2-8 and 2-9, respectively.

---

1. Sonar Data Control
2. Fairing, Tailpipe
3. Flap Assembly
4. Entry Ladder Tread
5. Aileron
6. Lavatory Mirror Frame
7. Accelerometer, Mechanical
8. Computer, True Speed
9. Radio Beacon
10. Wing Tip Red Light Lens
11. Seat, Toilet, Plastic
12. Oven Assembly, P-3 Galley
13. Door Assembly, Right Hand, Bomb Bay
14. P-3 Galley Refrigerator
15. Propeller, Aircraft, Variable Pitch
16. Radome Boom Assembly, MAD
17. Feather Override Button
18. Wheel Assembly, Nose Landing Gear
    (Prendergast, 1991, p. 39)

Figure 2-7
ASO Survey Items

Prendergast applied the model using the same 12 characteristics as used originally by Wenger. Following Wenger's procedures, the model was streamlined by eliminating noncontributing characteristics as indicated by the cluster analysis.

```
1.   Bread Slicing Machine
2.   Fork, Field Mess
3.   Dishwashing Machine
4.   Ice Maker, Flake
5.   Dispenser, Bulk Milk
6.   Oven, Microwave, Electric
7.   Kettle, Steam Jacketed, Electric, 60 Gal.
8.   Ice Cream and Shake Maker, Soft-Serve/Refrigerated
9.   Meat Slicer, Electric
10.  Stove, Gasoline Burner
11.  Filter, Coffee Urn
12.  Saw, Band, Meat Cutting
13.  Steam Table
14.  Refrigerator, Pre-fabricated (Walk-In)
15.  Rack, Dishwashing
16.  Waffle Iron, Electric
17.  Vegetable Peeler, Electric
18.  Coffee Maker/Percolator
     (Prendergast, 1991, p. 40)
```

Figure 2-8
DGSC Food Service Equipment Survey Items

The streamlining process resulted in retention of the same six characteristics retained by Wenger, confirming the choice of attributes to be removed. (Prendergast, 1991, p. 76) However, Prendergast noted that:

> These characteristics are not absolute. Their validity has been shown once by Wenger, and then confirmed by the researcher. Future taxonomists should likewise continue to confirm that these attributes provide the best tools for classifying goods. (Prendergast, 1991, p. 91)

The study by Prendergast validated once again that goods procured by the Federal Government can be classified according to their inherent characteristics. This study will examine application of the Wenger model to the market research function and will demonstrate its utility.

```
1.    Chair, Straight
2.    Buoy Flag
3.    Container, Trash
4.    Ratguard, Ship
5.    Tiedown Assembly
6.    Anchor, Fluked, 750 Lbs.
7.    Landing Ship Bow Ramp
8.    Console, Ship Control
9.    Propeller
10.   Rudder
11.   Seat, Toilet, Plastic
12.   Door, Watertight
13.   Anchor, Mushroom, 4000 Lbs.
14.   Buoy, Navigational
15.   Marker, Nun
16.   Stanchion Assembly
17.   Hatch Restraint
18.   Cathodic Rod
19.   Desk, Flat Top
      (Prendergast, 1991, p. 41)
```

Figure 2-9
DGSC Ship and Marine Equipment Survey Items

I. TAXONOMICAL APPLICATIONS

An important point to keep in mind is that classification is rarely viewed as an end in and of itself. Rather, classification systems are generally viewed as a means to improve the ability to interpret, predict, or control some facet of performance. (Fleishman and Quaintance, 1984, p. 44) This section will briefly examine the objectives, usefulness and, potential applications of taxonomy.

1. Objectives of Classification

There are several objectives of classification schemes in general. The primary objective is to describe the structure and relationships of constituent objects with regard to each other or similar objects. Classification simplifies relationships such that it enables general statements to be made about classes of objects. Additionally, classification

identifies boundaries between objects via differentiation. (Sokal, 1974, p. 1116)

A secondary objective of classification is the generation of hypotheses in describing relationships among objects. In fact:

> The principal scientific justification for establishing classifications is that they are heuristic (in the traditional meaning of the term as "stimulating interest as a means of furthering investigation") and that they lead to the stating of a hypothesis which can then be tested. A classification raises the question of how the perceived order has arisen and how the structure is maintained. (Sokal, 1974, p. 1117)

A tertiary objective of classification is ease of manipulation of information. Classification achieves ease of manipulation because the system consists of taxa that can easily be named and related to each other.

Other objectives include (Sokal, 1974, p. 1116):

1. Economy of memory

2. Facilitate communication

3. Ease of Information Retreival

2. Usefulness of Taxonomical Applications

The application of a taxonomy to a set of facts or objects results in adding more information to those facts and objects by revealing patterns and relationships, enabling predictions about those facts or objects, and guiding decisions. (Fleishman, 1982, p. 825) Classification schemes can disclose significant differences or similarities that may not otherwise be evident, or expose weaknesses in the existing knowledge base that require further investigation.

Fleishman and Quaintance suggest that a taxonomy has important practical and scientific implications for a variety of fields. In their treatise, they divide taxonomical uses

into two categories; the scientific-theoretical and applied-practical. The scientific-theoretical can be thought of as generic uses which can be useful in most disciplines. Among the most important areas of usefulness are the following (Fleishman and Quaintance, 1984, pp. 5-6):

1. Conducting literature reviews.

2. Establishing better bases for conducting and reporting research studies to facilitate comparisons.

3. Standardizing study or research methodologies.

4. Generalizing research to new tasks.

5. Exposing gaps in existing knowledge bases.

6. Assisting theory development.

A researcher's first encounter with classification takes place when conducting literature reviews to locate information relevant to the research question. Like this research effort, an element of difficulty occurs while conducting the literature review due to differing descriptors, terminologies, semantics, and measurement between the researcher and the literature. A taxonomy assists the researcher in describing relationships, in hypothesis formulation, and in information retrieval and manipulation.

Establishing better bases for conducting, reporting, and comparing research studies is an important element of the usefulness of taxonomies. A taxonomy may be useful in disclosing why studies can or cannot be compared. Though a classification may not be absolute, it will provide some insights for improving the conduct and reporting of a research endeavor. (Fleishman and Quaintance, 1984, pp. 5-6)

Frequently experimental studies within a discipline lack standards and measures that facilitate comparison of the results to various efforts. A taxonomy serves as a tool for standardizing, defining, and organizing the study. Thus,

standardizing methods of research is a measure of a taxonomy's usefulness. (Fleishman and Quaintance, 1984, p. 6)

Generalizing research to new tasks is another area of usefulness. A taxonomy assists in assists in extrapolating previous research efforts to new areas of application. It allows generalizing the knowledge from one set of circumstances to another, depending on the similarities or differences in the circumstances. (Fleishman, 1982, p. 821) Not only will a taxonomy generalize research to new areas, but it will also disclose gaps in the existing body of knowledge in a discipline. By delineating categories of a field, a taxonomy reveals where extensive research has been done, and conversely, where it remains to be done. (Fleishman and Quaintance, 1984, p. 6)

Finally, a taxonomy supports theory development. Success of any theory is dependent on how well the theory can organize the observational data. An adequate taxonomy seems to be a prerequisite to the establishment of quantitative relationships and theory postulation. (Fleishman and Quaintance, 1984, p. 6)

3. Role of Taxonomies in Contracting

Taxonomies can realize the same fundamental objectives in contracting as suggested in the previous subsection. The Wenger model could serve to advance the role of procurement research in the Federal Government, which would ultimately improve the procurement process.

Since the Wenger model is based on characteristics deemed important in the buying process, it would provide insight into the structure and relationships of goods procured by the Federal Government from the buying perspective. The taxonomy would enhance observations and clarify relationships among the goods. From this, general statements could be made about individual goods or classes of goods, thereby guiding decisions in the process. Differences identified between the

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goods, as well as similarities, would provide invaluable insight for decision making. (Sheehan, 1992, p. 46)

By identifying and describing relationships among the goods, the taxonomy would facilitate hypotheses formulation about those relationships. These hypotheses could in turn be tested, thereby clarifying relationships and expanding the knowledge base.

Wenger's taxonomy would also achieve economy of memory by enhancing the understanding of the goods. Additionally, the taxonomy would also facilitate ease of manipulation and retrieval of information in contracting, from both a theoretical research and practical application viewpoint. By classifying and labeling categories of goods, the model provides a framework for manipulation and retrieval of contracting information.

And finally, the taxonomy of goods procured by the Federal Government would achieve scientific-theoretical usefulness by enhancing literature reviews; establishing better bases for research conduct, reporting and comparison; standardizing research methodologies; generalizing research efforts to new areas of application; exposing gaps in the body of knowledge; and assisting in theory development. All of these would benefit the body of knowledge in Federal Government procurement and would thereby improve the procurement process.

4. Specific Applications in Contracting

As suggested by Wenger in his study, staffing levels for Government procurement offices could be determined by the type of goods procured by an organization. In his follow-up study, Edward Sheehan identified other areas which could benefit from the Wenger model. (Sheehan, 1992) Potential areas of application within the contracting discipline are contained in Figure 2-10.

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1. Market Research
2. Policy Guidance
3. Training and Education
4. Staffing
5. Procurement Reviews
6. Budgeting
7. Legislative Development
8. Regulations/Procedures
9. Contract Type Selection
10. Contracting Method
11. Change Control
12. Break-out Decisions
13. Unsolicited Proposal Procedures
14. Industrial base Decisions
15. Profit Guidelines
16. Source Selection Procedures
17. Administrative Procedures
18. Clause Selection
19. Specification Selection
20. Configuration Control
21. Independent Research and Development
22. Acquisition Strategy
23. Workload Management
    (Sheehan, 1992, p. 48)

Figure 2-10
Potential Applications of the Wenger Taxonomy

From the preceding list, one can deduce that the application of taxonomy to the contracting field encompasses almost every task area within the discipline. The benefits to be derived from the taxonomy, in its stage of infancy, are seemingly limitless. Since this research endeavor focuses on demonstrating the usefulness of the Wenger model to market research, a discussion of the other application areas is not practicable. For more indepth coverage of other areas of application, interested individuals can consult Sheehan, 1992, or Persinger, 1993.

J. SUMMARY

This chapter has examined the basics of the science of taxonomy and considered some existing classification schemes. The primary objective of this chapter was to introduce the taxonomy developed by Wenger, for which its utility and usefulness for performing market research will be the focus of this research effort. The next chapter examines the current state of market research in the Federal Government procurement process. It examines various definitions for market research as well as the legislative requirements for conducting market research. Chapter III introduces the general usefulness of taxonomy as it applies to market research.

III. APPLICATION: MARKET RESEARCH

A. INTRODUCTION

One of the most potentially beneficial applications of the taxonomical structure for classifying goods procured by the Federal Government is in the area of market research. (Sheehan, 1992, p. 56) In hearings before the Senate Armed Services Committee, the General Accounting Office has repeatedly stated that the failure to perform market research was a "major procurement deficiency." (Nash and Cibinic, 1993, p. 11) While market research has been developed as a study within the marketing field of business administration, substantial background and experience has been developed and recorded in this field so that the concept of market research is well understood by marketing practitioners. However, significant effort will be required to bring the Government's procurement personnel up to an effective level of competence in applying the techniques of market research to their source finding, qualification and, selection responsibilities. (Sherman, 1991, p. 121)

Market research is an area where the taxonomical structure and methods used in the discipline of marketing and postulated by the Wenger model can be most directly extrapolated to the field of contracting. (Sheehan, 1992, p. 56) This application of the taxonomy could be instrumental in shoring up a continuing weakness in Government procurement, especially in this era of rapid technological change, decreasing budgets, and a shrinking defense industrial base. (Sheehan, 1992, p. 57)

This chapter examines the need to conduct market research as well the Congressional intent underlying the statutory requirement for market research in Federal Government procurements. Various definitions of market research are

reviewed. The theoretical application of the taxonomy and benefits of that application are also analyzed.

B. THE NEED FOR MARKET RESEARCH

Congress recognized the need for conducting market research through its passage of the Competition in Contracting Act (CICA) of 1984. (Mulhern, 1991, p. 23) In hearings before the Senate Armed Services Committee, many witnesses testified that the failure to perform market research was one of the major factors responsible for the absence of competition in Government procurement. (Nash and Cibinic, 1993, p. 12) The Senate report stated that:

> Competition in contracting depends on the procuring agency's understanding of the marketplace. In addition to advance procurement planning, market research is essential in developing this understanding. Agencies which fail to scope the market for potential competitors--often resort to sole-source contracting when competition is available. (Nash and Cibinic, 1993, p. 12)

Professor John Cibinic's testimony at a hearing before the Senate Committee on Governmental Affairs in 1982, was cited in support of the need to codify the requirement for advance planning and market research. An excerpt is quoted below:

> Opportunities for obtaining or improving competition have often been lost because of untimely, faulty, or the total lack of advance procurement planning. Noncompetitive procurement or inadequate competition also has resulted many times from the failure to develop specifications or to perform adequate market surveys and identify potential sources. (Committee on Governmental Affairs, United States Senate, 1982)

Since the passage of the Competition in Contracting Act, the General Accounting Office (GAO) has repeatedly come down

hard on the contracting community, especially in the Department of Defense, for failing to carry out the market research mandate. (GAO, 1990, p. 4) In particular, the GAO noted that market survey efforts were lacking or poorly done and that announcements in the *Commerce Business Daily* (CBD) were the only market survey efforts conducted. (Mulhern, 1991, p. 33) This continued finding in subsequent GAO reports(GAO, 1984 1987, 1990), clearly indicates that the CICA injunctions concerning market research and acquisition planning remain to be assimilated by the Federal Government acquisition community. (Mulhern, 1991, p. 33)

The CICA legislation contains a number of policy statements, which when analyzed carefully, really amount to Congressional urging that the agencies do a better job of planning and preparing for competitive procurement. (Sherman, 1991, p. 119) One of the most controversial statements calls for the agencies to prepare advance procurement plans buttressed by market research. (Sherman, 1991, p. 119) Although the advance procurement plan is a type of document that has existed within the Government bureaucracy for at least 25 years, this new legislative mandate called for better use of the devise. Establishing such a requirement in law amounted to the Congress expressing its belief that executive branch procuring activities were not doing the kind of advanced thinking and planning necessary to achieve an effective procurement process. (Sherman, 1991, p. 119)

1. The Competition in Contracting Act of 1984

The Competition in Contracting Act (CICA) refers to market research in three separate provisions. All references to market research are expressly linked to and associated with "acquisition planning." The term, market survey, also is used on two occasions. It appears that the Congressional intent of market survey was synonymous with market research. (Sheehan, 1992, p. 11)

Specifically, the law says the following with respect to market research (Yoder, 1993, p. 11):

Sec. 303A. (a) (1) In preparing for the procurement of property or services, an executive agency shall--use advance procurement planning and market research.

Sec. 2301. (a) (5) ...the head of an agency shall use advance procurement planning and market research and contract specifications in such a manner as is necessary to obtain full and open competition with due regard to the nature of the property or services to be acquired;....

Sec. 2305. Contracts: Planning, Solicitation, Evaluation, and Award Procedures (a) (1) (A). In preparing for the procurement of property or services, the head of an agency shall--(ii) use advance procurement planning and market research;....

The association of market research with acquisition planning in the statutory language makes it clear that market research is envisioned as a forward-looking activity that should affect the contracting officer's ability to obtain competition, at least with regard to the nature of the property or services to be acquired. That is, when market demand is strong enough to support more than one supplier. (Mulhern, 1991, p. 1-3) In the context of CICA, market research is clearly intended to offer an opportunity to reduce barriers to competition by improving the information available to the contracting officer when an acquisition is being planned and prior to a solicitation being issued. (Mulhern, 1991, p. 1-4) By placing market research in this position the statute makes market research the central function, both in achieving competition and in justifying noncompetitive contracts. Thus, it makes market research the foundation of the competitive decision. (Mulhern, 1991, p. 1-4)

2. Federal Acquisition Regulation

The Federal Acquisition Regulation (FAR) is the implementing document for all legislation concerning acquisition, including CICA. The FAR mandates both market research and acquisition planning.

FAR Part 7 (Acquisition Planning) requires, under the caption Plan of Action, that the contracting officer "indicate the source of supplies and/or services that will meet the need and it also requires the contracting officer to":

> Describe how competition will be sought, promoted, and sustained throughout the course of the acquisition.--If noncompetitive contracting is being recommended, identify the source and discuss why competition cannot be used.--Discuss source selection procedures for the acquisition, including the timing for submission and evaluation of proposals, and the relationship of evaluation factors to the attainment of the acquisition objective. (FAR 7.105)

Unlike CICA, FAR Part 7 does refer to market research by name and it clearly requires the performance of market research functions. (Mulhern, 1991, p. 1-5)

Part 11 of the FAR (Acquisition and Distribution of Commercial Products) mandates that market research and analysis be conducted not only to "ascertain the availability of commercial products" but also to "identify the market practices, including warranty terms, of firms engaged in producing, distributing, and supporting these products." (Mulhern, 1991, p. 1-5) Specifically, FAR Part 11 mandates additional use of market research within the context of acquisition plans, stating,

If the acquisition or part of it is for commercial-type products, (the plan) should address the results of the market research and analysis and indicate their impact on the various elements of the plan. If the acquisition or part of it is for other than commercial or commercial-type products, address the extent and results of the market survey conducted.... Once the Government's needs have been functionally described, market research and analysis shall be conducted to ascertain the availability of commercial products to meet those needs.... (FAR Part 11.100-6)

3. The Federal Acquisition Streamlining Act of 1994

The Federal Acquisition Streamlining Act (FASA) of 1994 signed into law on October 13, 1994, has several provisions that will affect the way in which Government buyers performs market research. First, Section 4202, provides that once the Government-wide implementation of the Federal Acquisition Contracting Network (FACNET) is complete, CBD synopsis 15 days prior to the release of the solicitation will no longer be required for purchases at or below $ 250,000. (Carney, 1994, p. 14) This provision will reduce the open period for advertising by as much as one-third, from 45 days to 30 days.

A second provision has even more significance with respect to the conduct of market research. In Section 8104, FASA states that to the maximum extent practicable, contract requirements and market research should facilitate use of commercial items. Section 8104 goes on further to say:

The agency must conduct market research prior to development of a new specification and before soliciting bids/proposals for a contract in excess of the Simplified Acquisition Threshold (SAT) and shall use the results of this market research to determine whether commercial items or, if commercial items are not available, nondevelopmental items are available or could be modified to meet the agency's needs. (Carney, 1994, p. 19)

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Like CICA and FAR, FASA does not define or describe market research in clear or concise terminology. However, it does propose certain requirements that will depend on effective market research. FASA clearly intends that all possible market research is done before a decision to proceed is made for a procurement involving new specifications and greater than the SAT. FASA's emphasis on commercial items and nondevelopmental items will require an effective market research program in order to satisfy its legislative intent.

C. DEFINING MARKET RESEARCH

Despite the legislative intent of CICA and its implementation through the FAR and the subsequent GAO reports, contracting officers have lacked a clear, working definition of market research. Lacking such a definition, many contracting officers are confused by the market research requirement, since they associate market research with selling activities not in their markets, but in consumers' markets. They do not see much commonality of their activities with those of consumer market researchers. (Mulhern, 1991, p. 23)

Contracting officers could be helped to understand the Congressional mandate by a familiarity with industrial purchasing because most are engaged in a pursuit whose closest civilian analogue is industrial purchasing. A definition that draws on industrial purchasing will help deal with the CICA requirement. To be acceptable, a definition must be broad enough to include the kind of research that is utilized in both the industrial and consumer marketing environments.

Dr. John Mulhern, Director of the Fels Center for Government Research at the University of Pennsylvania, has broadly defined market research as:

An intellectual effort on the part of a purchaser to ascertain in advance, on the basis of information, what the response of other participants will be to an offer to buy goods and services and what their performance will be if a contract is formed. (Mulhern, 1991, p. 24)

Dr. Mulhern's definition contains five key elements; intellectual effort, forecasting(ascertain in advance), information, response, and performance. The first element in his definition, intellectual effort, pertains to the collection, display, analysis and evaluation of information or market data. Disseminating the information for comment and decision is a subset of the first element.

To "ascertain in advance" implies the reason for carrying on market research is to be able to forecast, with some degree of confidence, the most likely response to an offer to buy or sell. A study of market conditions can help a contracting officer predict the likely response to a solicitation issued under given conditions, and thus promote a more effective acquisition plan and procurement. (Mulhern, 1991, p. 24)

The third element, information, relates to data and other subjective information that is germane to the situation. The information should contain relevant information on the market sector, size, and tier, and should also be economical to use, easily accessible and conveniently formatted.

Response refers to the contracting officer's ability to predict what the response of participants will be to the solicitation. In fact, the nature of the expected response to a solicitation is the first element that market research should forecast, since market research should be used in developing solicitations. (Mulhern, 1991, p. 25)

Finally, performance pertains to a buyer's expectation for market research. The buyer is interested in finding out whether a prospective source will perform, and at what price/cost, and when. The Government's approach to market

research is more akin to what commercial industry would define as purchasing research. (Yoder, 1993, p. 9) The National Institute of Governmental Purchasing defines purchasing research as:

> A continuing process in all active purchasing departments involving investigation and research into new and improved or alternative materials and sources of supply with an ever open door to new offers. (National Institute of Governmental Purchasing, 1992)

Richard Stewart in his study of market research for effective competition in Federal procurement proposed yet another definition for market research. He defined market research as "the collection and analysis of data to improve the quality of specific definitions which must be made within the existing framework of the procurement process." (Stewart, 1987, p. 15)

FAR Part 7 defines market survey analogous to market research. It is "attempts to ascertain whether other qualified sources capable of satisfying the Government's requirement exist." (FAR, Part 7.105) By this definition, the FAR defines market research in terms of obtaining adequate competition. This is a valid use of the market research principle. However, this limited definition does not recognize the full spectrum of applications for which the contracting officer can use market research. (Yoder, 1993, p. 10) The FAR definition seems to deemphasize some of the benefits which effective market research can provide. For example, the definition fails to consider negotiating leverage that market and vendor information provide to the buyer and which may create cost and/or price savings. (Yoder, 1993, p. 10)

The Armed Services Pricing Manual (ASPM), Volume 2, contains a table of "Market Research Techniques, Applications,

and Impacts" that lists 15 different techniques and states their applicability to different kinds of situations. (ASPM, Vol. 2, p. 12-2) However, the ASPM does not put forth a definition of market research *per se*.

Specifically, the ASPM states:

> Moreover, the greatest potential benefit of market research occurs when procurement offices use (1) knowledge of current technology and trends, (2) understanding of the commercial marketplace, and (3) meaningful presolicitation contact with the private sector and others to influence the development of a competitive solicitation package. Market research is used to obtain more competition and to facilitate contract pricing. (ASPM, Vol. II, p. 12-1, 12-3)

The list of techniques has several features of interest. First, it describes some techniques as applicable to all buys, while it recognizes that some techniques are applicable in only certain circumstances. (ASPM, Vol. 2, p. 12-2) Secondly, some of the techniques do not qualify as market research for the contracting officer. Of note is the technique which calls for determining why selected contractors did not respond to the solicitation. Dr. Mulhern correctly asserts that this technique presupposes that market research has already been conducted and the responses of the contractors did not conform to the buyer's expectations. Dr. Mulhern did state, however, that this technique would be a valid method of market research for future procurements of the same item. (Mulhern, 1991, p. 1-8) All in all, the ASPM list provides a useful checklist for the contracting officer interested in starting a market research program, but it still fails to adequately define market research.

Two additional concepts pertaining to market research merit discussion before concluding this section. The Defense Systems Management College advocates two concepts which go beyond the FAR's restrictive definition. The first concept is

"market surveillance." It is defined as "an ongoing process of the acquisition agency to canvass the technology and product developments in its area of expertise." In contrast, market investigation has a more narrow application. Market investigation is "conducted in response to a defined need and focuses on specific solutions." (Commercial Practices for Defense Acquisition, p. 2-4)

The abundance of seemingly divergent definitions of market research has undoubtedly added some confusion to its understanding. The Congress in its CICA legislation would have been better served had it chosen a term such as purchasing research versus market research. Some of the confusion between marketing research and market research could have been avoided by adopting the purchasing research term. Combining Dr. Mulhern's proposed definition with that of the National Institute of Governmental Purchasing(NIGP), best describes the concept of market research. (Yoder, 1993, p. 9) For purposes of this research, the definition of market research will be the combination of those proposed by Mulhern and NIGP, which are reiterated below for reference purposes:

> An intellectual effort on the part of a purchaser to ascertain in advance, on the basis of information, what the response of other participants will be to an offer to buy goods and services and what their performance will be if a contract is formed. (Mulhern, 1991, p. 24)

> A continuing process in all active purchasing departments involving investigation and research into new and improved or alternate materials and sources of supply with an ever open door to new · offer. (National Institute of Governmental Purchasing, 1992.)

The term market research must be properly defined in order to distinguish it from terminology and concepts which resemble and are often confused with marketing research.

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Market research should not be confused with or used interchangeably with marketing research. Unfortunately, the term market research is most commonly associated with the field of marketing. In marketing, a distinction has been made between marketing research and market research.

> Care should be taken to distinguish between marketing research and market research. Marketing research (or alternatively, scholarly research in marketing) always seeks to expand the total knowledge base of marketing. In general, market research attempts to solve a particular company's marketing problem. (Hunt, 1983, p. 2)

Marketing research, or discipline research, refers to research on the body of knowledge in marketing. (Sheehan, 1992, p. 57) It is concerned with advancing the study of marketing. Marketing research is generally concerned with investigating opportunities to sell goods and services. (Stewart, 1987, p. 35) In particular, marketing research deals with influencing and persuading potential customers that a particular product is better than other products, or a product meets a particular customer's needs. Marketing research is also used in defining opportunities for product development and positioning in the marketplace. Thus, it is clearly seller oriented. (Yoder, 1993, p. 8)

Market research can be thought of as a subset, element, or type of marketing research. Contrary to the definition above, research on the market not only solves a particular company's marketing problem, but it can also contribute to the body of marketing knowledge as well. (Sheehan, 1992, p. 57)

Similarly, market research in the field of contracting can be viewed from two perspectives. In his examination of market research for effective competition in the Federal Government, Richard Stewart discussed two views of market research. (Stewart, 1987) From a macro view, market research can advance the body of knowledge in contracting and improve

the procurement process by revealing trends in the marketplace that need to reversed, or practices that work better than others, or policies which enhance competition. Research on the market will therefore expand the total knowledge base of contracting, and ultimately, improve the procurement process. (Sheehan, 1992, p. 57) Viewed from a micro perspective, market research can be used to enhance competition or gain an understanding of market forces for a specific procurement. (Stewart, 1987, pp. 28-30)

D. MARKET RESEARCH IN FEDERAL GOVERNMENT CONTRACTING

As discussed in Section B of this chapter, market research became a statutory requirement with the passage of CICA which said that "in planning for the procurement of property or services, an executive agency shall use advance procurement planning and market research." (Sheehan, 1991, p. 59) There are two issues which arise from that mandate for market research.

The first issue involves the lack of clarity of the scope of market research. The second issue concerns the Federal workforce that does not currently have the tools in place to carry out the mandate as intended by Congress. (Sheehan, 1991, p. 59) As expressed by Dr. Stanley Sherman:

> In the case of market research, it is not clear that the Federal workforce is prepared in training and attitude toward the marketplace to carry out the mandate. While government procurement personnel have for many years given at least some attention to the subject of advance procurement planning, there are no historical precedents for presuming that many of those currently employed in procurement are familiar with the concept of market research in an operational sense, that is, as a viable tool for securing information and assessing where to purchase their needs. (Sherman, 1991, p. 120)

Dr. Sherman's observation has been validated in several GAO reports concerning compliance with CICA. For example, all too often the only form of market research in many cases has been limited to an announcement in the Commerce Business Daily (CBD) 45 days before the bids/proposals are due to be submitted. Limiting market survey efforts to CBD announcements does not effectively promote full and open competition for other than already competitive items. (Mulhern, 1991, p. 39) This is evidence of the Government's need for improvement in the area of market research. It reflects the narrow or micro interpretation discussed in the previous section, as consisting of a survey of already existing Government sources. (Sheehan, 1992, p. 59) Furthermore, "If any firm, large or small, finds out about a requirement for the first time in the CBD, it is months, if not a year late in preparing to respond." (Stewart, 1987, p. 18)

Market research is intended to offer an opportunity to reduce barriers to competition by improving the information available to the contracting officer during the acquisition phase. The statute makes market research the central function in both achieving competition where possible, and justifying noncompetitive contracts where competition is not possible. (Mulhern, 1991, p. 34-35)

In his study, Richard Stewart developed a definition of market research and the principal elements of an effective market research program were proposed by adapting marketing research procedures. (Stewart, 1987) His study presented both a narrow and broad view of market research pertaining to the Federal Government procurement process, and advocated adoption of the broad/macro view. Specifically, he stated:

> One, the narrow view, holds that the purpose of
> market research is merely to identify potential
> sources of supply. In contrast, the broad view,

holds that market research involves far more that identification of potential sources of supply. In fact, the broad view is that the requirement involves understanding the market place and conducting the methodical research that is oftentimes necessary to develop that understanding. (Stewart, 1987, p. 9)

As such, Stewart defined market research as; "the collection and analysis of data to improve the quality of specific decisions which must be made within the existing framework of the procurement process." (Stewart, 1987, p. 34) Stewart's definition recognizes that there are numerous aspects of the procurement process that stand to be improved through the implementation of effective market research.

1. Benefits of Market Research

In addressing the question of why the use of market research is a good idea, Stewart wrote:

> ...because a knowledge of conditions in individual markets and the marketplace in general is essential to all facets of the Federal procurement process. Knowledge of who has supplied which products or services as well as who could supply them is needed to ensure all potential competitors have an opportunity to do business with the Federal Government. Knowledge of what is happening in the marketplace is a key ingredient in realizing fair and effective competition as well as arriving at a price that is fair and reasonable to both the buyer and the seller. One cannot consciously set about to routinely purchase high quality products without the requisite knowledge about the state of the art in quality control processes, manufacturing processes, and management techniques.

> A contract negotiator should have knowledge of the factors affecting a particular industry such as prices of inputs (past and projected), transportation factors, state of the art inventory and production management systems, and innovations that may be on the horizon. It doesn't matter

whether the negotiation involves a new missile type, an individual repair part such as a valve, or consumable items such as paper clips. (Stewart, 1987, p. 16)

It is evident that a thorough market research capability developed within the Federal Government procurement hierarchy would substantially strengthen the ability of the Government to use and enhance the purchasing process effectively, including, but not limited to, generating competition. (Sherman, 1991, p. 121) The CICA's implied coupling of market research with moves to increase competitive procurement could prove to be a significant step toward improved Government contracting. (Sherman, 1991, p. 121)

2. The Section 800 Panel Recommendations

In the National Defense Authorization Act for 1991, Congress mandated that the body of acquisition laws be streamlined. Section 800 of the Act directed the Secretary of Defense to appoint an advisory panel of Government and private-sector experts to make recommendations for streamlining all laws affecting DOD procurement. Dramatic reductions in Defense appropriations and personnel dictated that the acquisition system be managed by fewer people and use far fewer tax dollars. (Yoder, 1993, p. 12)

According to Ms. Colleen Preston, Deputy Under Secretary of Defense for Acquisition Reform, there were two reasons for the urgency to change the current acquisition laws: regulations and practice. First, past acquisitions had been largely successful. The DOD acquisition system had produced the best weapon systems and support structure in the world. But past success does not imply the system is perfect or guarantees future success. (Yoder, 1993, p. 12)

Secondly, and perhaps more importantly, "is the fact that today's acquisition system evolved to meet needs of the DOD and industry that have in the last few years fundamentally

changed." (Preston, 1992, pp. 1-14) Among some of the fundamental changes are the rapidly advancing technologies in certain commodities and markets requiring dramatically reduced acquisition lead times. It is also recognized that commercial markets are driving the state-of-the-art, not DOD, as had been the case in the past. (Yoder, 1993, p. 13)

The Section 800 Panel iterated the current philosophy as follows:

> The world is a different place, and the challenges facing DOD are fundamentally different than they were even four years ago. Few things are constant or predictable, and new technology developments enable the breaking of the rules and practices that at one time made perfectly good sense. The world in which DOD now must operate has changed beyond the limits of the existing acquisition system's ability to adjust or evolve. It is not enough to improve the existing system, we need a fundamental rethinking and reinvention of the acquisition system if we are to be able to respond to the demands of the next decade.
>
> If DOD is to continue to improve its efficiency, reduce acquisition costs, and maintain its technological superiority it MUST ADOPT THE BEST PRACTICES OF COMMERCIAL COMPANIES....(Emphasis added) (Yoder, 1993, p. 13)

The Panel was obviously advocating increased usage of commercial items and commercial business practices however, there is also an implicit endorsement of performing market research at least to the extent utilized in the private sector. Specifically, the Panel suggested that Section 2325, of 10 U.S.C. be amended to require DOD action as follows:

> Prior to acquiring a defense unique item, ... perform market research to determine whether commercial or non-developmental items, or modified commercial items, can be used in place of a defense unique item. (Yoder, 1993, p. 14)

The Panel clearly recognized that market research will be vital if DOD is to continue its successes into the next decade. The future will require agencies to perform effective market research, to look diligently for commercial items early in the procurement, and to use commercial items when they satisfy the minimum need. The Panel's emphasis on combining commercial practices and commercial products is a clear endorsement of the need to conduct effective market research and the benefits to be gained. (Yoder, 1992, p. 14)

E. ELEMENTS OF EFFECTIVE MARKET RESEARCH

So far, this chapter has considered how market research can be defined as well as what it encompasses. The question that next arises is: What elements constitute an effective market research program? To answer that question, Stewart delineated five elements of an effective market research program based on his analysis of the literature and observations of both Government and private industry. The five elements are (Stewart, 1987, p. 40):

1. Criteria for Project Selection

2. Proper Research and Analysis Skills

3. A Methodical Approach

4. Timely Information

5. Effective Communication of Findings

The first element, criteria for project selection, recognizes that the most efficient use of limited resources must be achieved. Therefore, a program must establish a process for selection of projects to be pursued. (Stewart, 1987, p. 40)

Proper research and analysis skills refers to the need for trained personnel applying the proper techniques or tools.

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It is a waste of resources to gather a great deal of information and then fail to apply the requisite skills to analyze and interpret its meaning. (Stewart, 1987, p. 41)

A methodical approach requires an organized and systematic undertaking in order to prevent duplication of effort or omission of important information. A scientific approach must be taken to ensure the research procedures are applied in a consistent and organized manner. (Stewart, 1987, p. 42)

Timely information is an important element, and without it, all efforts to this point would prove futile. Timely information is necessary to assimilate the results of the research in acquisition planning. If market research must start from the beginning each time information is needed, it will probably be completed too late to be used in the procurement. (Stewart, 1987, p. 43) However, if the information is organized and general principles have been developed, the buyer need only determine which principles apply to the present situation and access that information. (Sheehan, 1992, p. 63)

With regard to the fifth element, effective communication of findings, an effective market research program must have a means of getting the right information to those who need it, in the form they need. In order to be effective, the information provided must be in a form that is both understandable and useful to the recipient. (Yoder, 1992, p. 63)

F. APPLICATION OF THE TAXONOMY IN MARKET RESEARCH

Implementation of the Wenger taxonomy of goods procured by the Federal Government would facilitate market research in several areas. First, the taxonomy would enhance market research because it would serve as the framework for conducting organized and systematic research of the overall

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market, revealing trends or problem areas, or ways to improve the procurement process, and advancing the body of knowledge. (Sheehan, 1992, p. 64) Secondly, the taxonomy could be used to provide a logical access to market information for use in a specific procurement. (Sheehan, 1992, p. 64)

To be effective the taxonomy would first be operationalized, with all goods procured by the Federal Government classified, then the classification scheme could serve as the basis for organizing market research. Research on the market could be done on a category by category basis, providing an organizational framework for systematic study. (Sheehan, 1992, p. 64)

If market research were conducted along the lines of the categories of the taxonomy, literature reviews would be made easier because information on the market could be accessed by the category to which an item belongs. The categories could serve as the bases for conducting and reporting research studies to facilitate their comparison. Observations of goods within individual categories may then be generalized to other goods in the same categories. (Sheehan, 1992, p. 65)

Application of the taxonomy to market research may expose areas where further research is needed. At the present time there is no framework consistently used throughout the Federal procurement process for the accumulation and storage of market research. The taxonomy would provide a consistent approach for accumulation and storage of market information. (Sheehan, 1992, p. 65)

Application of the Wenger taxonomy would also facilitate several of the elements of Stewart's principles of an effective market research program. The first element, criteria for project selection, would be enhanced by the taxonomy because the first step would simply be whether or not there is any existing information available on the procurement at hand. For instance, if a buyer received a procurement

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request for a centrifugal pump, that buyer could access a database of existing market research by the category of the pump, perhaps moderate complexity, to determine if there is any existing market research information available. The buyer could then determine whether further research is necessary or requires initiation. The taxonomy would provide a means for searching for, and utilizing, existing information, or confirming that none exists. (Sheehan, 1992, p. 66)

The taxonomy would provide the necessary structure for a methodical approach to market research, thereby, satisfying the third element of an effective market research program. For example, market research could begin with the simple or complex category, or any other category for that matter. Research could then be conducted on that category on a regular, continuous basis, methodically expanding the knowledge base. The taxonomy, as a scientific method, would guide market research in a consistent and organized fashion. (Sheehan, 1992, p. 66)

As discussed previously in Chapter II, a taxonomy would allow the cataloging of information relevant to a good. As such, the requirement for timely information would be enhanced by the implementation of the taxonomy. Market research information would be provided in a timely manner since much of the information could already be catalogued for quick retrieval. (Sheehan, 1992, p. 67)

The final element, effective communication of findings would be simplified by the taxonomy, since this is also a function of indexing market research according to the categories of goods. This would provide those who need the information a mechanism to access the information. As proposed earlier, if a buyer needed information on a centrifugal pump, that buyer could quickly access and retrieve information stored under the category which applied to the pump. Similarly, organizing market research around the

taxonomy would allow findings to be related back to the body of knowledge in the same manner, again encouraging more effective communication of findings. (Sheehan, 1992, p. 67)

Other applications of the taxonomy to market research identified by Sheehan include (Sheehan, 1992, pp. 67-70):

1. The taxonomy may reveal certain categories of goods that are well suited for procurement from small businesses.

2. Organizing market research in relation to the taxonomy may force recognition of shared characteristics among seemingly different industries.

3. Based on the category to which an item belonged, market research centered on the taxonomy may reveal other companies, not otherwise considered, capable of manufacturing the item.

4. Market research conducted along the framework of the taxonomy may show that products considered different, may actually share common characteristics.

5. Market research organized by the taxonomy may reveal lower prices or specific price trends, so that an organization may potentially time its procurements to take advantage of favorable price movements.

As the preceding discussion showed, implementation of the Wenger taxonomy of goods would provide several tangible benefits in the area of market research. In addition to identifying sources of supply by individual category to enhance competition, it could also serve as the framework for conducting methodical research, and thus enhance understanding of the marketplace. The taxonomy would be the tool by which the procurement workforce would make market research a viable process.

The taxonomy would facilitate the conduct of market research through the cataloging of results for future use. This would therefore improve the quality of specific decisions made within the procurement process as postulated by Stewart's

definition of market research. Ultimately, it would result in a more efficient use of tax dollars and enhance the ability of the process to provide quality products to users as called for by the Section 800 Panel.

G. SUMMARY

This chapter presented the issues in market research, and discussed how the procurement and market research processes could be improved through the implementation of the Wenger taxonomy of goods procured by the Federal Government. The chapter reviewed several versions of a definition of market research and discussed the statutory requirements for market research.

Chapter IV discusses the methodology of the research for this study. It presents the data collected as a result of the surveys received and interviews conducted.

IV. RESEARCH METHODOLOGY AND DATA

A. PURPOSE

The purpose of this chapter is to outline the research methodology used, the underlying reasoning for the structure of the methods and the data gathered as a result of this research effort. Information gathered from interviews conducted with buying office supervisors and experts in the field of contracting are discussed in this chapter also.

B. RESEARCH METHODS

As stated in Chapter I, the premise underlying this research effort was to apply the Wenger Taxonomical Model to the market research activity of buying organizations. The primary data collection method used was a nine page survey. The survey used is contained in the Appendix. The data from these surveys was analyzed using limited quantitative and qualitative analysis of responses to questions contained in the survey. After analyzing the survey responses, telephone interviews were conducted with supervisory personnel from the buying offices selected and contracting professionals who took part in the previous taxonomy research efforts of Wenger, Prendergast, and Sheehan.

Using a survey as the primary data collection method required as large a population of respondents as possible for sufficient analysis. The total targeted population for the research effort was 54. The intended survey population was broken down as follows; ASO (6), ATCOM (20), ARSC (3), and Sikorsky Helicopter Company (25). However the survey population was dramatically reduced to 29 when Sikorsky Helicopter informed the researcher with less than four weeks remaining in the research that they would not participate in the survey due to concerns about proprietary information being revealed in the survey.

Although it was unreasonable to expect that all buyers would have previous experience with buying all items listed on the survey, it was felt that the buyers would have sufficient name or nomenclature recognition and working knowledge of the goods in the survey in order to provide useful data. This expectation on the part of the researcher was not realized and nomenclature recognition would emerge as a potential structural deficiency in the taxonomy.

1. Selection of Goods

In selecting the H-60 Blackhawk helicopter as the major weapon system, the researcher drew heavily upon the experiences and recommendations of CDR Jack Prendergast in his validation effort of the Wenger taxonomy. (Prendergast, 1991) Specifically, Prendergast cited difficulties with nomenclature recognition on the part of buyers as a concern in his study. (Prendergast, 1991, p. 82-83) Also during several telephone conversations with CDR Prendergast, he suggested selecting a major weapon system that was prevalent in more than one Armed Service. He recommended using the H-60 helicopter since it was currently in service inventories in different configurations of all four Armed Services. It was hoped that by narrowing the application to one platform which was common to several of the Services, the data would be more consistent and problems of nomenclature recognition would be minimized.

After selecting the H-60 Blackhawk helicopter, a review was conducted of several schematics, purchase requests and basic ordering agreements. From these resources, a sampling of components and parts was selected for classification by the buyers in the survey. The goods ranged from items as complex as the T700 GE 401 Engine to items as simple as an airframe rivet. The selection of these goods satisfied several of the heuristics outlined in Prendergast's study which recommended that:

1. The items would need to be fairly recognizable since the sole identifier for the respondent was the nomenclature. The aim was to select items that would have name recognition for even the most casual observer.

2. The items to be surveyed would be a part of a homogenous grouping based on the organization of the activity selected.

3. The descriptions of the items to be classified were to be purposely generic to avoid creating an *a priori* bias in the survey. (Prendergast, 1991, p. 37)

2. Selection of Buying Offices

Selection of the buying offices to query in the survey was driven by the selection of the H-60 helicopter itself. The activities chosen for the survey were the Navy Aviation Supply Office (ASO), Philadelphia, Pennsylvania; the Army Aviation Troop Command (ATCOM), St. Louis, Missouri; and, the Coast Guard Aircraft Repair and Supply Center (ARSC), Elizabeth City, North Carolina. These organizations were chosen because they satisfied the criteria of a sufficiently large population of buyers and expected nomenclature recognition.

ASO, ATCOM, and ARSC were also selected because of similarities in allocation of buying responsibilities. At all three organizations, buying responsibilities were allocated based upon the type aircraft supported. All three organizations had buying offices tasked with sole support of the Service's variant of the H-60 helicopter.

C. SURVEY DESIGN

The survey used for this research effort was designed to accomplish four main objectives. The first objective was to have the buyers classify a set of goods according to the model developed by Wenger. The buyers were given the requisite definitions and scales to complete the classification. There was no attempt to educate the buyers in the underlying

scientific concepts and mechanisms of the Wenger model. Since the taxonomy designed by Wenger presumed that the classification of goods would be performed by select personnel knowledgeable in the precepts of taxonomical classifications, there was no perceived need for the queried buyers to have in-depth knowledge of taxonomy. Instead, the buyers would only need to be able to apply or manipulate the classifications provided.

By having the buyers in this study actually perform the mechanics of classifying the selected goods, it was hoped that the exercise would stimulate interest in and possible applications for the taxonomy with respect to performing market research.

The second objective of the survey was to briefly assess the current understanding of the market research concept by the respondents. Questions one and two of the survey were designed to measure the degree to which the buyers understood and practiced the concept of market research in their present procurements.

The third objective of the survey was to have respondents answer questions pertaining to the application of the taxonomy with respect to performing market research. After completing the classification first, and then answering general questions concerning market research, the researcher hoped the survey design would prompt the buyers to see potential applications to and benefits of the taxonomy as it pertains to performing market research.

Finally, the last objective was to have the buyers designate six market research activities that they believed should be performed within each characteristic category. The purpose of this portion of the survey was to see if certain patterns in market research emerged from the general designation of activities by characteristic.

D. SURVEY DATA AND RESPONSES

Presentation of data and responses from the surveys follows the following format. First, the significant results and data from the surveys completed by the Government activities queried are presented. Next, telephone interview information from the supervisors of the buying offices queried is presented. Thirdly, telephone interviews conducted with experts in the field of Contracting which focused on expanded applications and possible structural impediments is discussed. In the final section of this chapter the researcher outlines some general observations on problems and obstacles encountered in conducting the survey.

1. Survey Responses

A total of 29 surveys were requested from the buying offices in the following quantities; ATCOM (20), ASO (6), and ARSC (3). Of the 29 surveys requested, 18 were returned and were completed in sufficient detail to provide meaningful information for a total response rate of 62%.

2. Classification of Goods

Of the 18 surveys returned, only 9 respondents completed the actual classification of the goods for a 50% participation rate for the classification section of the survey. Despite the researcher's assumption in the survey design that buyers would not necessarily need to have purchased these items previously but only need to recognize the item nomenclature, the buyers experienced problems with completing the classification. Sample reasons given by the respondents for not completing the classification included the following;

- "I don't know the goods listed in these terms."

- Three respondents stated that they possessed, "No working knowledge of these items."

- "This is too hard."

● "This should be done by technical."

The researcher performed some basic statistical analysis of the classification values assigned by the buyers, using the personal computer based program, *Business SYSTAT.* In reviewing the classifications provided by the buyers in the nine classification surveys completed, the researcher observed numerous items with varying classification values assigned by the buyers. The researcher input the classification values assigned into the SYSTAT program and performed simple statistical analysis and stem and leaf displays. The output of the analysis exhibited significant fluctuations in classification values assigned by the buyers. For example, the anti-collision light lens and forward wheel tire had significant deviations among the classification means as well as stem and leaf plots which revealed widely dispersed assigned values. Several of the characteristics' classifications had standard deviations about the mean which could change the classification of a good from one level to another. Tables 4-1 and 4-2 summarize the deviations among the tire and lens classifications performed by the respondents.

The significance of the variations in classifications assigned is important for a couple of reasons. First, it is not yet clear who would perform the classification of goods according to the Wenger model. It is presumed in the Wenger study that the classification would be performed by a cadre of taxonomy professionals and the results of their effort would then be provided to others, such as buyers for use. (Wenger, 1990) In contrast, Prendergast and Sheehan envision a system where inputs for classification are gathered in a database from buyers, presumed to be at the time of award, and subsequently catalogued.

Column headings in Table 4-1 and 4-2 represent the following:

C1-Complexity   C2-Customization   C3-Maintainability
C4-Unit Cost   C5-Documentation   C6-Item Attention

Tire						
	C1	C2	C3	C4	C5	C6
MEAN	2.333	2.556	2.444	2.556	2.222	2.111
STANDARD DEVIATION	.866	.726	.726	.726	1.093	1.054
VALUE RANGE	1 - 4	2 - 4	2 - 4	2 - 4	1 - 4	1 - 4
MOST FREQUENTLY CITED VALUE	2	2	2	2	1 & 3	1 & 2

Table 4-1:   Statistical Output of Tire Values
Source: Developed by Researcher

Lens						
	C1	C2	C3	C4	C5	C6
MEAN	2.667	3.00	2.111	2.222	2.222	2.667
STANDARD DEVIATION	1.00	1.00	1.054	.833	.833	1.00
VALUE RANGE	1 - 4	2 - 5	1 - 4	1 - 3	1 - 3	1 - 4
MOST FREQUENTLY CITED VALUE	2 & 3	3	1 & 2	3	3	2 & 3

Table 4-2:   Statistical Output of Lens Values
Source: Developed by Researcher

A second important factor involving variation in classification values is simply the level of understanding the individual buyer possessed about the good.   The taxonomy can therefore highlight differences in buyer knowledge concerning a good.   If, for example, a pre-established baseline classification for goods procured within a certain buying office is established, a form of a test could be administered to the buyers to look for deviations. From an analysis of the deviation, training can be formulated to improve the buyer's

level of knowledge about the goods procured.

Thirdly, differences in values assigned can have profound implications with respect to how a buyer perceives the inherent characteristics of a good and their impact on market research. From a buyer's perspective, his or her classification can impact the nature and focus of market research for a particular good. If, for example, a buyer who is experienced in the electronics industry knows that recent advances in technology have moved a good from the high complexity category to the moderate, he or she may alter the market research activities in which they would engage. Yet, another buyer who is unaware of these market forces, may perform market research based on his/her perceived understanding of the inherent characteristics of the good and therefore may perform the market research from the taxonomical classification based on a flawed perception. The last column of the classification portion of the survey asked the buyers to list in order of importance to conducting market research, the rank order of the characteristics for the goods classified. There were a total of 187 rankings provided by the respondents. The most important characteristic was Complexity, which was cited in 59 (32%) rankings of the surveys. The second most significant characteristic was Customization which was identified in 45 (24%) of the goods and the respondents listed Unit Cost as the third most important characteristic in 35 (19%) of the goods.

3. Answers to Market Research Questions

As eluded to earlier, the buyers were asked to provide a definition of market research as they understand it. This question was designed to ascertain the basic level of understanding of the market research concept. Responses to the market research questions fell into three general categories. The first category of responses could be described as representing a partial understanding of the

market research concept in general. That is, the respondents in 7 of 19 surveys, only focused on finding alternative sources or suppliers. There was no consideration or mention of the marketplace conditions, trends, and forces in the definitions provided. Nor was there any evidence to indicate the buyers gave any consideration to ascertaining in advance of a procurement, those market forces in effect. In Chapter III a definition of market research was discussed and proposed. That definition highlighted the necessity to identify in advance conditions, trends, and forces in the marketplace as well as the state of suppliers. The definitions provided by the buyers in their responses only focused on the suppliers themselves and not the marketplace. The following is a sample set of responses received in this category;

- "Seeing what firms are available or interested in supplying a needed good or service."

- "Activities to encourage competition and develop sources."

- "How readily available is the item and can a number of suppliers supply the item."

The second category of responses could be characterized as those activities constituting market research as opposed to a definition of market research. Five of 19 surveys cited *Commerce Business Daily* (CBD) synopsis as a definition of market research. Of these five responses, two also cited advertising in the *Competition Advocates Shopping List* (CASL) as a definition of market research.

The last category is not actually a category but rather observations by the buyers themselves. Two of the respondents stated that the items they purchased were sole source and thus no market research was required. A third buyer stated that market research was the responsibility of the requiring

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activity or Program Manager's Office, while two others simply stated that they performed no market research whatsoever but gave no reasons why.

Question 2 of the survey requested the buyers to provide a list of market research activities that they engage in on a regular basis. This question had ample room to list up to nine activities, however, in twelve of the 19 (63%) surveys, only one or two activities were given, those being CBD or CASL advertisement. The remaining surveys cited either vendor sales personnel or procurement history files.

4. Most Important Characteristic for Market Research

The next questions of the survey asked the buyers to state which of the six characteristics of the Wenger taxonomy were the most important for purposes of market research and why. This question was designed as a check to the buyers' prioritization of characteristics in the classification exercise of the survey. As stated earlier in Subsection a above, 32% of the respondents cited Complexity as the most important characteristic, while 24% identified Customization. In this narrative answer, six of 19 cited Complexity while 4 of 19 identified Customization for 32% and 21% respectively. These responses essentially validated the rankings provided in the classification exercise. Unfortunately, none of the respondents gave reasons for their observation.

The next survey question, Question number 4, asked the buyers to identify what market research activities should be engaged in, given the most important characteristic cited in Question 3. Again the majority of survey respondents, ten of 19 (53%), stated that CBD/CASL synopsis was the only market research activity necessary.

5. Application of the Taxonomy to the Acquisition Process

The next section of the survey focused on application of the taxonomy to procurement. The buyers were asked if they

believed the taxonomy had applications to areas of procurement in general, and if the taxonomy could be applied specifically to performing market research. The researcher had hoped that after completing a classification of goods themselves, the buyers might perceive applications or benefits of the taxonomy to the areas of procurement and market research.

Of the 19 buyers who responded to these questions, only four felt that the taxonomy had applications in either procurement or market research. One respondent felt that the taxonomy would be very beneficial in developing an Acquisition Strategy. The buyer perceived that the taxonomy would assist in making decisions as to whether the procurement should be a "Best Value," Invitation for Bid, or Negotiated acquisition. This buyer did not elaborate any further but it was encouraging to the researcher to see an application which had been previously identified in the Sheehan study as being apparent to a front-line procurement practitioner.

A second buyer said, "...[it] would help the buyer to get a feel for the type of item and its most important function as it relates to other items." This statement, which was followed-up by a phone interview, depicted a recognition by the buyer that the taxonomy may assist in seeing relationships and similarities between seemingly unrelated goods which share a similar characteristic classification. Prendergast and Sheehan in their previous research efforts also identified this application. For example, Sheehan compared two seemingly different products, a personal computer and a ship positioning computer, and found though they appeared different, the taxonomy highlighted important similarities among the goods. (Sheehan, 1992, p. 65)

6. Application of the Taxonomy to Market Research

There were only two positive responses in the entire survey set applying the Wenger taxonomy to market research. Both of the positive responses stated that the taxonomy could

apply to market research by providing an organized system to catalogue information about goods in a database. Both respondents felt the taxonomy, if implemented, would aid in data retrieval about goods which had been classified.

7. Market Research Techniques

The final portion of the survey asked the buyers to indicate from a list of widely accepted market research techniques, which market research technique was the most significant given that a good was; (1) highly complex, (2) made exclusively for the Government, (3) had very high maintenance requirements, (4) very high unit cost, (5) high amount of documentation, and (6) a good that is always given single-item attention. The purpose in asking this question was to see if, given a certain set of inherent characteristics from the model, the inherent characteristics would help to guide the market research techniques applied.

The following market research techniques in order of precedence by characteristic were provided by respondents:

- <u>Complexity</u> - CBD Synopsis, Draft Solicitations, Bidders' Conferences, Market Survey, Vendor Technical Personnel, Vendor Site Survey.

- <u>Customization</u> - Bidders' Conferences, Draft Solicitations, CBD Synopsis, Market Survey, Vendor Technical Personnel, Trade Journals/Shows.

- <u>Maintainability</u> - Bidders' Conferences, Market Survey, Vendor Technical Personnel, Draft solicitations, Vendor Catalog/Product Brochures, Industrial Advertisements.

- <u>Unit Cost</u> - CBD Synopsis, Procurement History File, Vendor Catalog/Product Brochure, GSA/Federal Schedules, Vendor Sales Personnel, Draft Solicitations.

- <u>Documentation</u> - Bidders' Conferences, Draft Solicitation, Procurement History File, CBD Synopsis, Market Survey, Trade Journals/Shows.

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● Item Attention - Procurement History File, Vendor Sales Personnel, CBD Synopsis, Bidders' Conferences, Vendor Catalog/Product Brochure, GSA/Federal Schedules.

The techniques cited by the buyers differed in content and context among the various characteristics. No two characteristics exhibited the same exact market research techniques. The buyers demonstrated that, in fact, the inherent characteristics as given in the survey, did influence the scope and direction of the market research effort that they felt should be engaged in.

E. TELEPHONE INTERVIEWS WITH SUPERVISORS AND EXPERTS

Given the less than optimal response rate to the surveys, the researcher expanded the scope of the research methodology to include telephone interviews with supervisors in the buying offices and recognized experts in the field of Acquisition who had taken part in the previous taxonomy research efforts of Wenger, Prendergast and Sheehan. Though the intended focus of this research was to demonstrate the application of the taxonomy to market research from a practitioner's stand-point, the researcher felt it was necessary to use telephone interviews in order to further explore the potential applications and analyze potential impediments to the application of the taxonomy to market research as discovered during the survey process.

Interviews conducted with the supervisors of the ATCOM and ASO buying offices reiterated the application of the taxonomy to cataloguing of information about the goods. They felt the taxonomy would be useful in classifying information on goods, industries, trades, and vendors according to the classification scheme.

Ms. Lehman, the Director of Contracting in the ATCOM Blackhawk buying office stated that the taxonomy would be helpful in identifying the important characteristics of a good

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in the instant buy. By focusing the buyer's attention on the significant characteristics, she believed the market research effort could be more efficient and tailored to the procurement at hand. However, neither Ms. Lehman nor Mr. Foley, the buyer supervisor at ASO, saw any further applications.

The supervisors did discuss potential structural problems with using the taxonomy. One of these centered on nomenclature while, the second problem was not so much a structural problem with the taxonomy but rather a structural problem in the organizations of the buying offices themselves. Both of these problems have potential impact on the application of the taxonomy. These problems are discussed in further detail in a later section of this chapter.

1. Applications Identified via Telephone Interviews

As one of the experts to interview, the researcher first contacted CDR Jack Prendergast of ASO, who had performed a validation study of the Wenger model in 1991, to discuss the survey results and to solicit his thoughts on applying the taxonomy to market research. During the interview, application of the taxonomy as a measure of buyer knowledge and item recognition as they impact market research was discussed. As noted during the survey process, several buyers stated that they did not know the items listed for classification in the survey yet these items were taken from basic ordering agreements and purchase requests actually administered by the buying offices queried.

CDR Prendergast believed the taxonomy could be used as a means to measure the buyers' level of recognition and knowledge of goods purchased by a buying office. The taxonomy could be administered to assess a buyer's degree of understanding about the product he/she purchases. Through a comparison to a presumed baseline taxonomy, training and

education deficiencies would be identified and a tailored training program could be followed to overcome the gap in knowledge.

Government buyers have often been criticized in the past for not knowing what it is they are buying. In order to perform effective market research, a buyer requires at least a rudimentary understanding of a good, its function, its characteristics, its markets, and market forces which impact the industry. The taxonomy could be used to measure deficiencies in these critical market research areas and training programs could be implemented to overcome them. In Chapter II of this thesis, taxonomies were identified as being able to expose gaps in knowledge. By exposing gaps in the buyers' knowledge of a good's inherent characteristics and structuring training to expand that knowledge, the market research effort can only be improved simply by having more knowledgeable buyers.

A second application of the taxonomy to market research coincides with the emphasis within DOD to shift to more Electronic Commerce (EC) and Electronic Data Interchange (EDI). The recent Process Action Team chartered by the Deputy Under Secretary of Defense (Acquisition Reform) (DUSD,(AR)), on electronic commerce envisioned significant increases in the number of procurements involving EC/EDI. (Deputy Under Secretary of Defense (Acquisition Reform), 1993)

During a telephone interview with Mr. Gregor Macfarlan of the Logistics Management Institute, he stated that the taxonomy could have significant impact on EC. For example, he envisioned that when a vendor registers its company in the EC network, the goods and services of its business could be classified according to the taxonomy by either the company or the Government. Once the vendors and their goods are registered and classified respectively, the explosion in database management and information retrieval would enhance

the ability to conduct effective market research. For example, if a buyer needed to procure a good, such as a personal computer, classified as a high amount of technical complexity, the buyer could search the database for those vendors who registered their products at that same classification level. The search could reveal new potential vendors through the good's taxonomical classification.

Other applications identified by interviewees focused on the ability of the taxonomy to improve competition by helping to identify vendors who, for example, are experienced in producing goods of a certain degree of complexity or customization who may be interested in producing other goods of a similar classification but have not done so in the past. Ms. Coates, President of Coates and Company, and a National Contract Management Association Fellow, believes the taxonomy has profound implication for market research in light of the current Industrial Base concerns of DOD. She saw the taxonomy as being an effective means to classify goods and vendors, and increase competition as contractors convert from DOD to commercial business. Specifically, the taxonomy would enable buyers to identify the key characteristics of a good to a particular procurement and that identification would enhance the buyer's ability to search out and locate a larger number of vendors who are capable of satisfying the requirements of the good. In effect, the buyer would use the taxonomy to target industries, trades or vendors experienced in making goods with similar characteristics but have not done so before for DOD.

Mr. LeRoy Haugh, Vice President of the Aerospace Industries Association of America, believed the taxonomy could improve market research significantly especially in light of the Secretary of Defense's memorandum on military specifications (MILSPEC) and standards and the Federal Acquisition Streamlining Act of 1994.

In his memorandum, Dr. William Perry, Secretary of Defense (SECDEF), promulgated a policy change in MILSPEC usage such that they are now the exception, rather than the rule in DOD procurements. (SECDEF, 1994) Mr. Haugh stated the taxonomy could be applied to market research in that, those items classified as being in the high degree of Customization grouping should be reviewed for applicability of MILSPEC standards. From the goods identified as such, market research could be done to identify other similarly classified goods which are using performance specifications and a comparison of production methods, quality standards, and raw materials, etc., to ascertain the availability of a suitable good not subject to MILSPEC. For example, if we had two very similar goods classified as highly complex, yet one had a low degree of customization while the other had a high degree of customization, a buyer seeing this relationship as a result of the taxonomy could perform an analysis to ascertain the differences in customization caused by methods or performance specifications and apply that knowledge to future procurements. Thus the taxonomy would enhance the market research function by identifying goods which would require increased market research efforts to meet the new MILSPEC policy guidance.

Another significant application to market research identified by Mr. Haugh, is highlighted by the recent passage of the Federal Acquisition Streamlining Act of 1994. In this Act, the small purchase threshold has been raised from $ 25,000 to a range of $ 50,000 to $ 250,000 depending on a Government organization's degree of automated procurement. In Mr. Haugh's opinion, the Act emphasizes "Best Value" procurement more than ever, now, that nearly 98% of all DOD procurement actions will fall into this category and that $ 250,000 is a significant amount of money to most buyers. It is imperative that buyers understand the importance of market

research in order to conduct "Best Value" procurements. But, if a buyer does not recognize the inherent characteristics of the good to be procured, he felt, "Best Value" would be difficult to achieve. To quote Mr. Haugh,

> The days of off-the-back of the envelope are over. Best Value must be considered in every procurement, and unless the market research effort is grounded in a thorough understanding of the important characteristics in the instant buy, the effort will fall short of the mark.

2. Structural Problems Associated with Applying the Taxonomy to Market Research

The most frequently cited structural problem with respect to applying the taxonomy involved nomenclature recognition. In the Wenger model, classification of a good was driven solely upon the basis of its nomenclature. As noted in his research and experienced as well during this researcher's effort, Prendergast found that nomenclature recognition as the sole identification driver of the taxonomy posed problems for survey respondents and the researcher. A significant percentage of the respondents in this effort also reported difficulty with nomenclature recognition. There was adequate evidence in the survey responses and telephone interviews with supervisors that the buyers did not know the items they were purchasing. Several buyers remarked that they did not know what the items on the survey applied to even though the introduction to the survey clearly identified the goods as parts and components of the H-60 aircraft. Both of the buying office supervisors at ATCOM and ASO admitted that their buyers routinely do not know the items they are supposed to be purchasing by nomenclature.

Ms. Coates stated that the problem of a lack of uniformity in terminology which subsequently impedes nomenclature recognition is the single, most significant stumbling block to applying the taxonomy. Specifically, she

said, "a lack of uniformity in terminology compounds the problem of nomenclature recognition and must be overcome before the taxonomy can be applied effectively." She stated that this nomenclature problem is not unique to the Government alone, but that she also experienced the same difficulty as a commercial purchasing manager. Differences in nomenclature usage among industries and trade is the norm and applying the taxonomy through nomenclature only may prove difficult. In fact she asked the rhetorical question as to whether this structural deficiency requires the development of another taxonomy to identify and classify alternative names/nomenclature for items to be classified.

In a telephone interview with Dr. James Lessig of the Logistics Management Institute, a noted expert in the field of taxonomy who has dealt extensively with taxonomies since the 1960's, expressed reservations about the Wenger model and its applications in the current computer era. He felt that given the advances in the abilities of computers and computer software to process, correlate, and retrieve data, taxonomies may be obsolete in today's environment. Specifically, he expressed reservations that the taxonomy is being applied in the wrong manner. He stated that taxonomies were devised to help the human mind organize and process large amounts of information. He observed that with taxonomies, the application or purpose for which it is required should be identified first, and then the taxonomy should be designed to fit that application. He observed that instead, in this instance, the applications are being researched to fit the taxonomy after design. It should be reiterated that the Wenger Taxonomy was designed to organize characteristics of goods for strategic buying purposes. In this context, Dr. Lessig's observation is correct. However, application of the taxonomy to other areas which have a "good fit" and can demonstrate its usefulness, is not inappropriate. Additional

discussion of this issue is presented in Chapter V.

A final structural impediment to applying the taxonomy involves the way in which Government procurement offices are currently organized. Both supervisors expressed concerns that buyers are increasingly focusing on "the process and not the product." The bureaucracy which has been ingrained into the Federal Government procurement process has isolated buyers to the degree that the buyers are more concerned with "what blocks on which standard form need to be checked off, rather than what it is they are in fact procuring." (Lehman, 1994) A series of processes and responsibilities has been built up over the years such that in most Government buying activities, significant barriers to communication exist between requirements, technical, and acquisition personnel. The decreased level of buyer knowledge about goods procured can be directly attributed to these barriers.

F. PROBLEMS WITH SURVEY ADMINISTRATION

There were a number of problems with the administration of the survey for the research effort. These included:

1. Despite mailing the surveys to all participating offices on the first of September, completion and return of the survey was delayed by the approaching end of the fiscal year and the impending start of a new fiscal year.

2. Buyers felt the survey was too cumbersome and too much like a test. The survey had two matrices to be filled out by the respondents plus narrative questions. One buyer observed that he had taken major exams which were easier to complete.

3. The unanticipated non-participation decision by Sikorsky Helicopter which was received at an extremely late period in the research effort, greatly affected the scope and intended focus of the research. The researcher had hoped to use responses from Sikorsky to see if cultural differences between the Federal Government and commercial industry, may exist in applying the taxonomy.

4.   By targeting only buyers in the buying organizations surveyed, the resultant population of adequate survey responses received for analysis may not have been sufficiently large enough.

5.   Of the 29 surveys returned, a significant number of the buyers expressed concerns, on either the survey itself or through their supervisors, that they were unqualified to complete the surveys.

G.   SUMMARY

This chapter outlined the survey methodology and presented the data gathered from the surveys. Additionally, significant points and observations from telephone interviews were presented as they pertained to application of the Wenger model or structural problems in its implementation. The final section provided general observations of the survey process and obstacles encountered in the survey process.

Chapter V will present an analysis of the data presented here in Chapter IV. A discussion of applying the taxonomy to gauge a buyer's level of understanding about goods he/she procures is presented. Additionally, the researcher will show how a market research model might be developed from buyers' responses about market research techniques for a good with a specified set of characteristics.

V. ANALYSIS

A. PURPOSE

The previous chapter presented the data gathered as a result of the surveys received and telephone interviews conducted. Though the completed survey sample size did not meet the criteria for a sufficiently large population to allow for significant statistical analysis, the information assembled from the research does allow for some analysis of the results. In this chapter, a synopsis of applications identified in previous literature and validated in this research are reviewed. The chapter presents observations from the data and interview information as they pertain to application of the Wenger model to market research. Finally, the chapter concludes with a discussion of potential structural and organizational impediments to application of the taxonomy to market research as identified within this study.

B. APPLICATIONS CITED IN LITERATURE AND VALIDATED BY THIS STUDY

Both Prendergast and Sheehan concluded that the Wenger Taxonomy would be useful for purposes of performing market research. Specifically, Prendergast cited the ability of the taxonomy, based on the inherent characteristics of a good, to facilitate the identification of commercial product substitutes. His conclusion was validated in this study through telephone interviews conducted with experts who also observed that the taxonomy could facilitate the necessary research for identification of COTS and non-MILSPEC governed goods. The experts interviewed believed the Customization and Complexity characteristics of the taxonomy provided a systematic and organized basis with which to conduct a review and search for suitable substitutes.

Meanwhile, in his research, Sheehan identified several applications of the taxonomy with respect to market research which were also validated by this effort. First, the ability of the taxonomy to catalogue information was observed by both the survey respondents and experts interviewed. Secondly, the taxonomy's ability to highlight characteristics' relationships between similar and dissimilar goods was also observed by a few of the buyers queried.

And lastly, the taxonomy has a unique ability to identify gaps in the knowledge of the buyers concerning the goods classified. By exposing those gaps in understanding, effective training can be tailored to the procuring office to enhance the level of knowledge the buyers in the office possess. As identified in Chapter IV, differences in an individual buyer's classification of goods against a pre-established baseline would help to pin-point areas of concentration for the buyer. Through increased product knowledge, the market research capabilities and effectiveness of the buyers should improve as well.

C. CLASSIFICATION OF THE GOODS BY THE BUYERS

The results of the classification exercise contained in the survey highlight several possibilities for impact on market research. First, from the discussion in Chapter IV, the researcher demonstrated how the classification values assigned by the buyers in the survey fluctuated significantly among some of the goods.

As succinctly stated by CDR Prendergast, this phenomenon may represent the worst case in that the buyers think they know a good when in fact they do not. And, as admitted by nearly 50% of the survey participants themselves, they do not know the goods they purchase in terms of the inherent characteristics of the taxonomy. The data gathered from the surveys and interviews conducted clearly show that the buyers

in this survey do not know the goods they are purchasing to the degree that they should. The Report of the U.S. Merit Systems Protection Board showed that this phenomenon is not limited to just these buying offices. Surveys conducted of Senior Executive Service personnel and defense industry contractors revealed that they also believe that Government buyers do not know the goods they are purchasing. (Levinson, Report of the U.S. Merit Systems Protection Board, 1992, p. 48)

The variances in the classifications from this research may also simply represent legitimate differences in perceptions based upon experience or understanding of the good. The fact that different buyers possess varying experiences and knowledge has an impact on the classification of the goods and how that classification may be applied by individual buyers. What is not clear is how to reconcile the differences among classifiers, especially buyers, within the same organization, office, or commodity, let alone across the myriad of different Federal agencies, personnel, and goods purchased.

The researcher has concluded that the differences among classification values assigned by the buyers in the survey was caused by both a lack of understanding about the goods and legitimate differences in perceptions and expertise about the goods.

In any event, knowledge about a good has a definite impact on the nature and depth of market research conducted on a good by a buyer. For those goods which a buyer feels he/she knows well, that buyer may not conduct market research as thoroughly as someone who does not know the good yet recognizes this limitation. Choices on market research activities to utilize will undoubtedly be influenced by the degree to which the buyer perceives their knowledge level.

Application of the taxonomy to market research will be heavily influenced by the knowledge and experiences of a buyer with respect to a particular good. Buyers who do not know the goods they are purchasing will have difficulty applying the taxonomy to the market research function. The research conducted herein has shown that due to their lack of knowledge about the goods purchased in the survey, the respondents experienced significant difficulty in completing the classification as well as conceptualizing applications of the taxonomy to market research.

The debate over how and by whom the classifications of goods according to the Wenger model is to be accomplished must consider its impact on market research. The researcher takes exception to the presumption in the previous taxonomy efforts that the classification of goods would be done by a cadre of professionals isolated from other procurement professionals. If the Wenger model is to be successfully applied to market research, the experiences, knowledge, and, expertise of buyers must be brought into the classification process. An effective taxonomy should not be done independent of the inputs of the users. Therefore, all acquisition professionals from requirements generators to logistics, technical, and buyer personnel must be part of the classification process. If any one group is excluded, the classifications may be biased and thus adversely impact the application of the taxonomy by other interested groups.

The unique perspective of each group involved in acquisition has profound implication on how an individual group may apply the taxonomy. Consequently, each acquisition group must be involved in the classification process. The unique knowledge, perspective, and expertise of each group must be considered when classifying the goods in order for the respective groups to be able to effectively apply the taxonomy.

D. UNDERSTANDING OF THE MARKET RESEARCH CONCEPT

From the surveys analyzed and interviews conducted, it is clear to the researcher that the level of understanding of the market research concept at the buying offices queried is minimal. Despite 10 years of acquisitions subject to the requirements of the Competition in Contracting Act (CICA), the buyers in this research barely demonstrated a rudimentary understanding of market research. In Chapter IV, the researcher showed that most buyers provided definitions limited to concerns involving supplier development and identification or types of market research activity. These definitions represent only a minor facet of the total market research concept described in Chapter III.

The researcher has concluded that education and training in market research must be increased for buyers. Unless the buyers have a better understanding of the market research concept, application of the taxonomy to market research will meet with limited success at best. Combining the market research concept with taxonomy training may improve the understanding and application of both concepts simultaneously.

With respect to market research activities employed by the buying offices, the almost universal reliance on CBD/CASL synopsis as the only form of such research indicates that market research, as defined in Chapter III and intended in the CICA legislation, is not being realized. The researcher believes, as does Mulhern, that CBD synopsis of an instant buy is really not market research, since it is not designed to contribute to the buyer's advance knowledge of the market, but rather a search of already known Government sources. As Mulhern stated, unless the information gathered as a result of the synopsis is somehow captured for use in future procurements, CBD synopsis is not really market research at all. (Mulhern, 1991, p. 25)

The heavy reliance on CBD synopsis as the single form of market research has profound implications for the recent FASA legislation. In Chapter III, significant effects of the FASA legislation with respect to market research were introduced. These included, the requirement for market research of commercial items and the provision which would not require CBD synopsis once the Federal Acquisition Contracting Network (FACNET) system is in place. With regard to commercial item market research, CBD synopsis will not satisfy this requirement. As discussed in the previous paragraph, CBD synopsis does not satisfy the market research requirement in the instant buy.

Relying on the CBD synopsis as a form of market research may pose problems in the future when the FACNET is operational in five years as is currently planned. If the synopsis requirement is deleted or shortened, the period to conduct market research in the instant buy will be greatly reduced. Therefore, other more comprehensive market research techniques other than just CBD synopsis will have to be employed by Federal buyers. Additionally, despite 10 years of CICA, the understanding of the market research function is dubious at best, and with the impending relaxation of the CBD synopsis requirement on the near-term horizon as a result of FASA, the ability of Government buyers to perform effective market research within the FASA timetable is doubtful.

For example, several buyers in the survey said that, "No market research is done because the items are sole source." An item that is categorized as sole source is a prime candidate for market research. The fact that buyers did not recognize this was disturbing to the researcher. The design of the taxonomy provides an important tool for the buyers to analyze the inherent characteristics of a good and provide an avenue by which the buyers may research reasons why a particular good is or is not a sole source item. By focusing

on the inherent characteristics of the good, the taxonomy may make identification and research of product substitutes more apparent.

The last section of the survey, which required the buyers to identify the salient market research techniques given a specified set of inherent characteristics, revealed that the buyers recognized the necessary market research techniques when focused on the inherent characteristics. The results of this exercise demonstrated that generally buyers understood what market research was required given certain characteristics. In Chapter IV, the results of the identification of required market research techniques by the survey respondents, given that a good possessed certain characteristics according to the taxonomical structure, revealed some interesting aspects of the buyers' understanding of market research and their ability to apply the taxonomy.

As noted above, the vast majority of the buyers did not exhibit a thorough understanding of market research from a definitional perspective. Similarly, their responses concerning routinely utilized market research techniques indicated an excessive reliance on CBD synopsis for performing market research in their offices. Yet, in the final portion of the survey, when asked to provide, in their opinion, the necessary market research techniques when focused on a given set of inherent characteristics, the buyers demonstrated a far broader awareness and application of various market research techniques. Except for the market research techniques cited in the Item Attention characteristic, which may have been the result of confusion over its definition, all other techniques represented a more thorough understanding of the characteristics and a well-conceived market research approach. The buyers' responses indicated that when asked to focus on the specified characteristics, a different group of market research techniques should be used rather than those they

currently are using.

The researcher believes that this portion of the survey demonstrated that the buyers could use the taxonomy to perform market research. In fact, the taxonomy proved useful in focusing the buyers' attention on the product and away from process. The taxonomy appeared to assist the buyers in identifying the market research techniques which were important to the characteristics. This exercise also showed, interestingly enough, that the buyers may understand more about the market research concept than first revealed in the beginning of the survey. The techniques identified by the buyers showed a more rational and logical approach to conducting market research than what they currently are doing and it implied a better understanding of the market research concept in general.

Despite 10 years of CICA, the researcher has concluded the buyers in the offices surveyed are far from performing market research as intended by the Act and subsequent regulations/directives. It is evident that buyers are focused more on processes rather than the products. Unless a concerted effort is made to expand the level of understanding of the market research concept, application of the taxonomy to market research may prove difficult.

E. ANALYSIS OF MARKET RESEARCH TECHNIQUES

In Chapter IV, the researcher presented responses provided by the buyers as to what market research techniques would be used given a good with a certain set of characteristics from the taxonomy. Table 5-1 presents those responses in graphic form. This table shows the individual characteristics crossed to the various market research techniques cited by the respondents.

For purposes of analysis, the researcher has categorized respondents' market research techniques into the following

five groupings: advertise, personal contacts, surveys of markets and vendors, history files, and literature reviews. Though the researcher identified only five broad categories for purposes of this analysis, it should be noted that other groupings are conceivable. The researcher concluded that the five groupings selected here, best captured the techniques identified by the respondents.

Characteristics v. Market Research Techniques

	ADVERTISE	PERSONAL CONTACTS	SURVEY OF MARKET & VENDORS	HISTORY FILES	LITERATURE REVIEWS
COMPLEXITY	CBD, Draft Solicitation	Bidders' Conference, Vendor Tech Personnel	Market Survey, Site Survey,		
CUSTOMIZATION	CBD, Draft Solicitation	Bidders' Conference, Vendor Tech Personnel	Market Survey, Trade Shows		
MAINTAINABILITY	Draft Solicitation	Bidders' Conference, Vendor Tech Personnel	Market Survey		Vendor Catalog, Industrial Ads
UNIT COST	CBD, Draft Solicitation	Vendor Sales Personnel		Procurement History Files	Vendor Catalog, GSA/Federal Schedules
DOCUMENTATION	CBD, Draft Solicitation	Bidders' Conference	Market Survey	Procurement History Files	Trade Journals
ITEM ATTENTION	CBD	Bidders' Conference, Vendor Sales Personnel		Procurement History Files	Vendor Catalog, GSA/Federal Schedules

Table 5-1: Characteristics v. Market Research Techniques
Source: Developed by Researcher

An analysis of these responses reveals some important insights to the market research function from the buyer's perspective. First, for the characteristics involving Complexity, Customization, and Maintainability, the buyers proposed basically sound market research activities and approaches. The use of CBD synopsis, draft solicitations, bidders' conferences, vendor technical personnel, and market surveys were common to all three characteristics. The remaining activities of site surveys, trade shows, vendor catalogs, and industrial advertisements did not exhibit any commonality among these three characteristics. From the analysis it can be postulated that for a good with a high degree of complexity, customization, and maintainability, the minimum market research activities should include; draft solicitations, bidders' conferences, contact with vendor technical personnel, and market surveys.

For these three characteristics the researcher felt that attendance at trade shows should have been cited by more respondents. Trade shows often showcase new technology and new developmental items that are on the horizon. As such, trade shows are forward-looking activities that can impact high technical risk items such as those with a high degree of complexity, customization, and maintainability. Additionally, information from trade associations would be useful in these areas as well. Therefore, trade show attendance and contact with trade association personnel are activities that also could be added to the simple market research model for these characteristics.

A comparison to the documentation characteristic shows that draft solicitations, bidders' conferences, and market survey have a degree of commonality to the activities of complexity, customization, and maintainability. The absence of contact with vendor technical personnel is significant since vendor technical personnel are frequently more

knowledgeable in the area of documentation than are buyers themselves. (Jehan, 1994, p. 8-9) The researcher believes vendor technical personnel would be invaluable to this characteristic. Therefore, if vendor technical personnel is inserted, the market research activities mirror those above. Thus, goods with a high degree of complexity, customization, maintainability, and documentation may share a common, simple market research model. That simple model might look like the following:

- Draft Solicitations

- Bidders' Conferences

- Contact with Vendor Technical Personnel

- Market Surveys

- Attend Trade Shows

- Contact with Trade Associations

- CBD Synopsis

In the documentation characteristic, the buyers cited procurement history files as a method for market research. Procurement history files are in fact a valuable source of information but their use warrants some caution especially with respect to documentation. Government buyers have been widely criticized in the past of mindlessly including specifications from previous contracts in new awards. (Jehan, 1994, p. 10) If Government buyers continue to use procurement history files as a source of market research information for documentation purposes, their use should be closely scrutinized to ensure needless inclusion of MILSPECS does not occur. In order to effectively utilize the procurement history files, the buyers will need to become more proficient in the use, understanding, and application of specifications.

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An examination of the unit cost characteristic reveals two unexpected responses. First, the respondents cited CBD synopsis as a market research technique for researching unit cost. CBD synopsis as a method of researching unit cost appears inappropriate and reflects the buyers' inclination to use CBD synopsis since it is mandated by law and relatively easy to do. CBD synopsis is merely a form of advertising and as such, no useful unit cost information would be derived. The only unit cost information received from this activity would come from responses received to the synopsis. However, not all capable suppliers may choose to respond for whatever reason, and thus, the unit cost information could be biased. Important unit cost information may not be discovered in this instance. Therefore, CBD synopsis as a form of market research for unit cost purposes is dubious at best.

Secondly, the buyers cited draft solicitations as a means to research unit cost information. Again, the researcher has concluded that this method would provide little, if any, useful unit cost information. Since draft solicitations are performed to solicit vendors' inputs with regard to such items as specifications, quantities, delivery schedules, and terms and conditions, it is doubtful that any useful unit cost information would be contained in the vendors' responses.

There are a number of more productive market research techniques for examining unit cost which are missing from the buyers' responses. Of note, is the absence of market surveys, industrial advertisements, trade journals, contact with trade associations and trade association personnel, and attendance at trade shows. Not a single buyer cited any of these activities as a market research technique for this characteristic, yet, the unit cost information gathered as a result would prove invaluable.

A close examination of many of the market research techniques employed by the buyers in this research shows that

the techniques in use today, could be characterized as being "backward-looking" techniques rather than "forward-looking" as market research should be. CBD synopsis which really may only target already known Government sources, procurement history files, vendor catalogs, and GSA/Federal schedules can be characterized as backward-looking or after the fact. Much of the market research information from these sources has occurred in the past. Whereas, the techniques which were missing from most of the buyers' responses, such as attending trade shows, contact with trade association personnel or trade journals, are more forward-looking. These sources tend to focus more on what is new and what is in development and, as such, could be described as forward-looking techniques.

F.   SOURCES OF MARKET RESEARCH INFORMATION

A comparison of sources of market research information and their frequency of use from this study and that of Dr. Harold Fearon in his 1976 study of the most widely used sources in industry reveals some interesting contrasts. Table 5-2 contrasts the percentages from the Fearon study to the percentages discovered in this study.

In his study, Dr. Fearon found that commercial industry relied heaviest on trade journals and magazines for their primary source of information. Contrasting his finding to that of this study where only 33% of the respondents utilized trade journals or magazines shows that Government buyers rely on trade or industry sources much less than commercial buyers. In fact, looking closely at the table, one sees that commercial buyers rely on trade information/sources more than any other method. However, the Government buyers from this study relied mostly on Department of Commerce publications, primarily the CBD synopsis, as the primary method of market research. This is most likely due to the fact that CBD synopsis is mandated in law and it is easier to do than many

of the other forms of market research. This is also further
evidence of the Government buyer using backward-looking market
research techniques.

Market Research Sources Utilization

Source	Fearon Study	This Study
Trade journals and magazines	83 %	33 %
Vendor Sales Personnel	80	33
Vendor Technical Personnel	73	50
Purchasing Personnel in other firms	73	0
National Association of Purchasing Managers publications	73	0
Vendor Publications	70	50
Trade Association publications	67	0
Books on Purchasing	63	0
Other Departments w/in the Firm	60	0
Corporate Annual Reports	57	0
U.S. Department of Labor publications	43	0
Consultants	37	0
U.S. Department of Commerce publications	27	83
Trade Association Personnel	20	0

Table 5-2: Sources of Market Research Utilization
Source: Developed by Researcher

Areas where the commercial buyer and Government buyer seem more in agreement on sources is the use of vendor technical personnel and vendor publications such as catalogs or brochures. Though the buyers in this survey did not exhibit percentages near those of the Fearon study, the relative order of precedence is more in line with that of the Fearon study.

The most significant observation from the simple comparison of the two studies is simply the amount of sources used in conducting market research. The commercial industry shows a much more diverse and thorough usage of available resources as shown in Table 5-2. Fully 70% (10 out of 14 sources) of the available sources are used in over 50% of the buys. However, the Government buyers used less than 35% (5 out of 14 sources) of the sources and only 3 of those sources were utilized in 50% of the actions. Those three sources were CBD synopsis, contact vendor technical personnel, and vendor publications. This comparison is further evidence of the Government buyer's inclination to use market research techniques which are either mandated by law or relatively easy to do.

The Armed Services Pricing Manual (ASPM) presents a chart which discusses market research techniques, applications to buys, and impacts on the procurement [ASPM, 1986, p. 12-2]. This chart is intended as a guide for Government buyers in conducting market research and states that, "market research may take many forms, and various techniques can be used, depending on what is being procured." A casual observer of the chart might possibly conclude that the techniques discussed are required market research techniques in order of precedence.

Table 5-3 below contrasts market research techniques discussed in the ASPM to those cited by the buyers in this research. A comparison of the market research techniques from

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these two sources reveals some interesting patterns. First, the buyers from this research cited almost all of the market research techniques found in the ASPM as if it were a sort of checklist to follow. Secondly, the usage percentages for the individual market research techniques are much higher here, in contrast to the techniques examined in the Fearon study discussed earlier.

ASPM and Survey Results

Technique	Type of Activity	This Study %
Investigate the Market	Market Survey	67
Brief Industry	Bidders' Conferences, Draft Solicitation	83
Contact Potential Contractors	Contact Vendor Sales & Technical Personnel	83
Visit Potential Sources	Site Surveys	17
Attend Industry and Trade Conferences	Trade Shows	17
Acquire Literature	Vendor Catalogs/Brochure, Advertisements, Trade Journals	67
Analyze Procurement History	Procurement History File Review	50
Advertise in Trade Journals		0
Use CBD Synopsis	CBD	83
Examine Federal Supply Schedules	GSA/Federal Schedules	33

Table 5-3:   ASPM and Survey Results
Source: Developed by Researcher

It appears as though Government buyers have interpreted the ASPM as a checklist of sorts to follow for purposes of

market research. Though the ASPM is a good guide for conducting market research, it is not intended as a checklist. The danger is that it is being used as a checklist within the acquisition process and not being used as guide that should differ on a case-by-case basis. The percentages seem to indicate that this is the case.

G. APPLICATIONS TO MARKET RESEARCH

From the literature review conducted and the data gathered from both the surveys and telephone interviews, the researcher has identified several applications of the Wenger model in market research. First, the taxonomy holds great promise for cataloguing the information about the myriad of goods procured by the Federal Government. The taxonomy provides a systematic and orderly means by which market research information can be captured in a database or information system. Literature reviews, categories for conducting and reporting on research studies, and identifying gaps of knowledge can be enhanced by the taxonomy.

Secondly, the taxonomy can be used to measure the degree to which buyers in a buying office actually know the goods they are responsible for procuring. By establishing a baseline classification of goods procured within a buying office, management could administer the classification scheme as a form of a "test." A comparison against the baseline classification would reveal areas where the buyers need further training in understanding the inherent characteristics of the goods they purchase. Through enhanced understanding of the inherent characteristics of the goods as a result of training, it can be presumed that the buyers would be more effective in conducting market research.

Using the taxonomy as a form of a test to measure buyer knowledge could reveal instances of inaccurate classifications

or circumstances where the buyers are unable to complete the exercise due to lack of knowledge about the goods. The various scenarios are depicted below in Tables 5-4 through 5-7. For purposes of the scenarios, the column headings represent the scale range of one through five for each characteristic of the taxonomy.

Table 5-4 represents a hypothetical classification baseline for a hydraulic servo valve which was produced after surveying 1,000 personnel. Participants in the survey would have included buyers, requirements, logistics, and technical personnel in the activity. The purpose of the baseline is to serve as the yardstick for measuring buyer knowledge about the good in question.

The symbols, "0," "+," and "-," used in the tables are derived from the Wenger study. Each grid allows for scoring within each category from simple to complex, based on an aggregate of the classifiers' inputs. A "0" symbolizes a score that fell near the middle. A "+" symbolizes a score near the upper end of a category and a "-" near the lower end.

Good: Servo Valve, Hydraulic   N=1,000

CHARACTERISTIC	1	2	3	4	5
Complexity			0		
Customization			+		
Maintainability				-	
Unit Cost			-		
Documentation				0	
Item Attention			+		

Table 5-4:   Good Classification Baseline
Source: Developed by Researcher

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Good: Servo Valve, Hydraulic   N = 1

CHARACTERISTIC	1	2	3	4	5
Complexity			-		
Customization			0		
Maintainability			+		
Unit Cost		+			
Documentation				0	
Item Attention			+		

Table 5-5: Inaccurate Classification
Source: Developed by Researcher

Good: Servo Valve, Hydraulic   N = 1

CHARACTERISTIC	1	2	3	4	5
Complexity			0		
Customization					
Maintainability					
Unit Cost			-		
Documentation				0	
Item Attention			+		

Table 5-6: Gaps in Classification
Source: Developed by Researcher

Good: Servo Valve, Hydraulic   N = 1

CHARACTERISTIC	1	2	3	4	5
Complexity					-
Customization					+
Maintainability		-			
Unit Cost				+	
Documentation		0			
Item Attention		0			

Table 5-7:   Buyer does not know Good
Source: Developed by Researcher

Table 5-5 depicts a plausible situation where a buyer has completed the classification.   This could be interpreted that the buyer has inaccurately completed the taxonomy and does not completely understand the aspects of maintainability and unit cost, while generally understanding the other characteristics. From the comparison to the baseline, the buyer could concentrate his training and market research efforts in the areas of maintainability and unit cost to bolster his understanding.

Table 5-6 is a scenario which highlights instances where the buyer was unable to complete the classification.   As discussed in Chapter IV, the researcher discovered numerous instances where buyers surveyed could not complete the classification of the goods.   This scenario shows how useful the taxonomy could be in uncovering gaps in knowledge about a good or group of goods for purposes of education.   Using the baseline as the standard, it can reveal potential gaps in a buyer's understanding of the good that may impact the market

research function. The hypothetical buyer in this scenario should concentrate his training on the areas of customization and maintainability.

The last scenario depicted in Table 5-7 shows the case referred to by CDR Prendergast where a buyer who thinks he knows a good really does not. Unlike the other scenarios, where the buyer had most of the classification correct or a couple of gaps, this buyer completed the classification, yet, a comparison to the baseline shows the buyer really has no idea of the inherent characteristics of the good. Most classification values assigned by the buyer differ significantly from the baseline. The buyer in this scenario clearly needs extensive training and the use of the taxonomy may have been the best method to discover that need. From the discussion earlier which proposed the taxonomy as a means to create simple market research models for a specific set of characteristics, it is possible that the model could identify the market research activities to use to improve the understanding of the good at the time.

The hypothetical scenarios above serve as a pictorial representation of how the taxonomy can be applied to assess a buyer's level of knowledge about a particular good. Once the taxonomy is institutionalized and all goods are classified, the taxonomy would serve as an effective measurement tool for assessing the degree to which buyers know and understand the goods for which they are responsible for procuring. After a buyer's knowledge is reviewed, that buyer could then refer to the simple market research model developed from the taxonomy for the category of the good and from there he or she could perform the necessary market research to improve the level of knowledge. And coincidentally, the process outlined above would simultaneously improve the buyer's market research capabilities.

The exponential growth in the capabilities of computers to organize and retrieve information, coupled with the taxonomy's ability to effectively capture the inherent characteristics of a good can enhance the market research function significantly. The growing emphasis on Electronic Commerce (EC) in DOD may provide the most unique opportunity to enhance the market research capabilities of DOD buyers if combined with the taxonomy. In Chapter IV, the researcher discussed the notion that when interested vendors register for inclusion in the DOD EC/EDI network, they could simultaneously classify their products according to the Wenger taxonomy. From the vendors' own classifications, (which could presumably be updated easily by the vendors as conditions, forces, trends, or technologies change), buyers could access the EC/EDI network and target certain industries, trades, or vendors based on the classification of the good from which the buyer is working for the instant buy. The prospect of combining the EC/EDI network with the Wenger model would significantly improve the ability of buyers to perform market research. Additionally, the combination of the taxonomy and the EC/EDI network will provide information far and above that already available in the Standard Industrial Classification (SIC).

The taxonomy has a number of applications with respect to market research that can enhance the implementation of several recent initiatives and the Federal Acquisition Streamlining Act of 1994. First, the movement within DOD away from the reliance on MILSPEC will present enormous challenges to the Federal Government's buyers. However, the Customization characteristic within the taxonomy provides a systematic and organized manner by which goods classified as being high in Customization (assuming that MILSPEC is the reason) can be reviewed and researched for applicability of performance specifications. The goods in this characteristic could be

analyzed and compared against other goods with similar applications yet not governed by MILSPEC to see how the performance specification is applied to the good. The function of market research based on the taxonomy can contribute significantly to the identification and review of goods governed by MILSPEC within DOD and the identification of alternative commercial items that suit the requirement.

A second initiative where the taxonomy applied to market research will enhance the implementation of a current initiative is in the areas of Commercial-Off-The-Shelf (COTS) procurements. With respect to COTS, market research utilizing the taxonomy will focus the buyer's attention on the inherent characteristics of the good in the instant buy. For example, a review of goods classified as having a high degree of complexity may reveal similar goods with no customization requirements. These goods could be researched for COTS applicability within the taxonomy. With the emphasis in Section 8104 of FASA on commercial item market research, the taxonomy would provide an organized and systematic framework with which to conduct the necessary research.

The Federal Acquisition Streamlining Act of 1994 with its increase in the small purchase threshold to a maximum of $ 250,000 and its implied emphasis on "Best Value" for simplified acquisition threshold (SAT) procurements, will require buyers to have significantly more knowledge about a good and its market. But if the buyers do not know the good as discovered in this research, research about the good's market will be haphazard at best. The taxonomy can be applied by the buyer to focus his/her market research on goods, or characteristics of the good for which the buyer lacks understanding. By exposing gaps in the buyer's understanding, the buyer can perform various market research activities such as attend trade shows or site visits to bolster their understanding. These activities will simultaneously improve

the quality and function of the market research effort as well as the conduct of "Best Value" buys.

H.   STRUCTURAL IMPEDIMENTS TO APPLYING THE TAXONOMY

The classification of goods in the survey validated the problem of item nomenclature recognition as previously discovered in Prendergast's research effort.   By choosing goods purchased in a single weapon system platform grouping and by buying offices organized around support of that specific aircraft platform, the survey was designed to overcome some of the problems identified in Prendergast's study with respect to item or nomenclature recognition. However, as Chapter IV has shown, the buyers in these offices had substantial difficulty with the classification exercise because of a lack of nomenclature recognition about the goods which are purchased by their office.

As an item nomenclature driven classification system, the Wenger model is heavily subject to the abilities of the classifiers to recognize the item from its nomenclature. Yet, the Federal Government procures numerous items that may not be readily identifiable from their names and the nomenclature used within the Federal Government may differ significantly from the industrial or trade nomenclature. Differences in industry and trade usage may inhibit application of the taxonomy to market research since market research as an outward looking concept may not be focused on the correct nomenclature.

The observation by Ms. Coates that the problem of lack of uniformity in terminology within the acquisition community or among industries leads to the rhetorical question as to whether we need a taxonomy developed to identify alternate names and similarities among differing nomenclatures.   A system that can ameliorate this lack of uniformity in

terminology and nomenclature will need to be developed if the Wenger model is to proceed.

The taxonomy as envisioned in previous research efforts presumes a classification process based on inputs of only a single group of acquisition professionals, whether they be buyers or other personnel. The debate concerning by whom the classification of goods is to be performed has an impact on the market research application of the taxonomy. The classification of goods should not be done independent of the professionals knowledgeable in the concept of market research or solely by them either. The inputs of these knowledgeable individuals will be crucial to the classification's application to market research by other buyers, just as the understanding of the technical and requirements personnel will shape the nature of the classification of the goods. Each of these interested groups possess biases based on culture and education which when manifested into the classification of goods may impede the application by other disciplines.

A consensus type classification among all the acquisition professionals involved in the acquisition process should produce a classification of goods which can be applied to the largest number of tasks. Since the taxonomy was designed to provide a methodical and scientific approach to all acquisition tasks, it is imperative that a classification process involving all perceived users be devised.

Finally, a structural impediment to applying the taxonomy to market research involves the structure of the buying organizations themselves. Data from the surveys and interviews with supervisors showed that buyers and other acquisition personnel continue to be separated by barriers associated with stovepipe structures. For example, buyers repeatedly stated that the classification of the goods in the survey should be done by technical or other personnel and that market research was the responsibility of the Program

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Manager's office or requirements personnel. These statements indicate communications difficulties and reinforce the researcher's conclusion that buyers are too focused on process and not the product. The application of the Wenger taxonomy will be most effective if these barriers are eliminated and cross-functional classification of goods procured is achieved.

In Chapter IV, the researcher noted a dissenting view of the application of the taxonomy as stated by Dr. Lessig. At first, his comment on the taxonomy being used in reverse seems correct. That is, he believed the taxonomy was developed first and then the applications were being researched to fit the taxonomy. His view is not totally inaccurate when the Wenger taxonomy is analyzed in the proper context. The Wenger taxonomy was designed to provide a scientific method to organize characteristics of goods for strategic buying purposes. And as such, his view that the applications of the taxonomy are being researched in retrospect is correct. However, as stated previously in Chapter II, one of the prerequisites of a taxonomy is its usefulness. This study has demonstrated the usefulness of the Wenger taxonomy as it pertains to improving the ability of Government buyers to perform market research. This study showed that application of the taxonomy to market research is a "good fit" of the taxonomy and, is, in effect, an after the fact application. However, even though the application to market research is being researched independent of the design of the taxonomy, it is does not diminish its useful application. In those instances where the taxonomy poses a "useful fit" to an area, it is appropriate to research its applicability.

I. SUMMARY

This study has shown that the taxonomy has application to the market research function in Federal procurements. Though the buyers who participated in this study did not exhibit a

thorough understanding of market research, nor did they demonstrate effective market research techniques, the taxonomy did prove useful in getting the buyers to focus on the inherent characteristics of the goods in the survey. By focusing on the inherent characteristics, the buyers exhibited a more thorough and rational approach to conducting market research.

The next chapter will present the researcher's conclusions from the survey data and interviews conducted. Additionally, recommendations for applying the taxonomy to market research are discussed. And finally, answers to the primary and secondary research questions as well as areas for further research are presented.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

The previous chapters outlined the concepts of the taxonomy and market research and presented the survey results of a group of buyers on the application of the taxonomy to market research. This chapter presents the conclusions reached by the researcher as a result of the literature review, survey data and telephone interviews. Also, a review of the primary and secondary research questions is presented as well as recommendations for areas for further research.

B. CONCLUSIONS

The survey design and subsequent analysis of the survey results revealed the following:

1. The buyers in this research possessed only a partial understanding of the market research concept.

Chapter III proposed a definition of the market research concept which took into account the forces and trends in the market, the availability of suppliers and an analysis of the factors affecting a potential vendor's decision to bid or not bid on a particular solicitation. The buyers in the offices surveyed still do not understand the basic market research concept as proposed. Responses to market research questions indicated only a rudimentary grasp of pieces of the total market research concept. Buyers in this research routinely equated market research as merely being a search for alternate sources.

Despite ten years of acquisitions governed by the CICA legislation, the intent of the legislation has yet to be realized at the buyer level. Specifically, buyers rely too heavily on CBD synopsis or other acquisition personnel such as technical or Program Management personnel to conduct market research.

2. **Buyers in the offices surveyed demonstrated an excessive reliance on CBD Synopsis as the only form of market research activity.**

Sixty-three percent of survey respondents listed CBD synopsis as the only form of market research conducted in their offices. This further evidences the buyers' tendency to focus on process and not the product. Reliance on CBD synopsis is most likely due to its statutory requirement and because it is relatively easy to do.

3. **The taxonomy proved useful in improving the market research function when buyers were asked to focus on a certain set of characteristics.**

Buyers demonstrated a much more rational and sound approach to conducting market research when they were asked to focus on a certain set of characteristics. Market research techniques cited by the respondents were forward-looking and more encompassing than those they used on a regular basis.

4. **The taxonomy for classifying goods has potential application to the market research function.**

This research effort has demonstrated the application of the taxonomy to the market research function. The ability of the taxonomy to aid in cataloguing information, identifying relationships among similar and dissimilar goods and to improve the level of understanding of the goods procured by a group of buyers can enhance the market research function. Buyers in this study demonstrated that when market research focused on the inherent goods of the taxonomy, more logical and rational market research techniques were employed.

5. **Buyers do not know the goods purchased by the buying offices in the detail and depth that they should.**

The buyers' responses to the classification portion of the survey and the interviews conducted indicate a lack of understanding about the inherent characteristics of the goods purchased by the activity. Respondents experienced

significant difficulty in applying the taxonomy classification to the goods surveyed. Survey respondents and interviewees conceded that Government buyers frequently do not know the goods they are procuring.

6. Buyers continue to focus more on the acquisition process rather than the product or good itself.

The data gathered from the survey and telephone interviews clearly indicated that buyers are more concerned with the process of buying rather than the product they are purchasing. The emphasis on process in the buying offices has forced buyers to overlook the inherent characteristics of the good they are buying. The emphasis on process over product compounds the lack of knowledge concerning the goods procured and inhibits the conduct of market research.

C. RECOMMENDATIONS

The following recommendations are made as a result of this research effort:

1. The application of the taxonomy to market research should be refined in the areas of commercial-off-the-shelf, MILSPEC identification and Best Value procurements.

These areas were suggested by the experts interviewed as some of the more promising areas where the taxonomy can be applied. The continued downsizing in DOD and the new initiatives in MILSPEC and COTS procurement can be facilitated by the taxonomy and its application to market research.

2. The taxonomy of goods procured by the Federal Government should be performed by a group of professionals from all disciplines involved in Acquisition.

The classification process for classifying goods procured by the Federal Government should involve all groups expected to apply the taxonomy. Each discipline would bring unique

perspectives, experiences, and expertise to the classification process that when manifested in the final product would facilitate application by each discipline concerned. The classification of the goods conducted by these personnel could serve as a classification baseline from which other applications can be derived.

3. **Buying offices should utilize the taxonomy to gauge buyers' level of knowledge about goods procured by the organization.**

The taxonomy may prove useful in measuring the degree to which buyers in a buying office know the goods which they purchase. By establishing an organizational taxonomy baseline, management could use the taxonomy to pin-point areas where buyers need further training and education in the goods they procure. A comparison of individual classifications to the baseline would reveal inaccurate classifications, goods which the buyers are unable to classify, and cases where a buyer believes he knows a good but does not.

4. **The taxonomy should be used to develop market research models for goods classified.**

Once all goods are institutionalized or classified, buying offices could utilize the taxonomy to develop market research models for goods it procures according to their inherent characteristics. The research showed that given a good with a certain characteristic profile, some commonality among market research techniques emerged such that a simple model of market research techniques could be postulated from the analysis.

D. RESEARCH QUESTIONS

Answers to the primary and secondary research questions proposed in Chapter I are presented below:

Primary Research Question:

To what extent can the Wenger Taxonomical Model for classifying goods purchased by the Federal Government be applied to the market research function?

The taxonomy of goods procured by the Federal Government would be useful in the area of market research. The research showed that the taxonomy could be applied as a gauge of a buyer's level of knowledge about a good's inherent characteristics. Understanding the inherent characteristics of good and focusing on those characteristics the buyers were able to exhibit more rational and sound market research techniques. From the analysis of market research techniques cited for a good with a certain characteristics profile, it is possible to devise market research models.

Subsidiary Questions:

1.   What is the most effective application of the taxonomical model to the market research function?

The most effective application of the taxonomy revealed by this study was its ability to get buyers to focus on a good's inherent characteristics and to then identify necessary market research techniques to procure the item effectively. The taxonomy provided an organized framework to analyze effective market research techniques for a good. The taxonomy demonstrated that its use would get buyers to focus more on the product rather than the buying process.

2. How can the taxonomy be used to improve the buyer level of knowledge about the goods for which they are responsible for procuring?

This study demonstrated how the taxonomy can be utilized to measure the level of buyer knowledge concerning goods procured. From an established taxonomical baseline, a comparison of individual buyer classifications could reveal instances where the buyers have gaps in knowledge about a good or when they think they know a good and in fact do not. The taxonomy would highlight areas where the buyers need to concentrate their training and market research efforts to improve their understanding and performance.

3. What market research techniques are essential for conducting effective market research given a certain set of specific characteristics?

Given a good with a high degree of complexity, customization, maintainability, unit cost, documentation, and item attention, the taxonomy revealed a significant degree of commonality among the market research techniques such that a rough market research model could be constructed. Careful analysis of all goods classified under the taxonomy may reveal certain market research patterns applicable to goods within a certain category. The models could then guide the market research efforts of the buyers as long as the classification profile is current and accurate.

4. What are the structural deficiencies of the Wenger Taxonomy that impede application to market research?

Item nomenclature proved to be a significant problem area for the buyers surveyed. As discovered in Prendergast's previous study of a larger grouping of homogenous goods and validated in this study also, item nomenclature was a problem. Despite narrowing the focus of this study to one weapon system and goods procured by buying offices responsible for that system and goods, item nomenclature posed problems for the

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classification and, consequently, the application of the taxonomy to market research. As an item nomenclature driven classification scheme, buyer or user recognition can impede effective application of the taxonomy. A method or system to ameliorate this structural deficiency must be devised if the taxonomy is to proceed.

E. AREAS FOR FURTHER RESEARCH

The following areas for further research are recommended as a result of this study:

1.   The taxonomy should be incorporated into the EC/EDI network for vendor registration of products provided.

A study should be conducted to examine methods and procedures for vendors to register and classify the goods they produce according to the taxonomy within the EC/EDI network for the Federal Government. Using the taxonomy as a guide, vendors or Government personnel could classify the products provided during the time of registration. The study could be done in conjunction with a student from the Information Technology Management Curriculum so that issues involving interfacing and integration are addressed at the same time. The application of the taxonomy in this process would enhance the market research function enormously and provide for rapid data retrieval.

2.   An examination of the process to construct a taxonomical baseline for a buying activity should be conducted.

This study proposed the establishment of a classification baseline at a buying activity for the purpose of measuring a buyer's level of knowledge or understanding about the goods he/she procures. The study recommended a consensus style classification involving logistics, requirements, technical, and buyer personnel as the classifiers. A study of a buying activity which procures a homogenous group of goods, such as

those buying activities involved in the Prendergast study, should be performed to: examine how the process would be implemented; and to explore means by which differences among the classifiers' classifications can be reconciled. Once a baseline classification is constructed, the researcher may then explore the use of the baseline for measuring and reconciling a buyer's level of knowledge about the good(s).

3. Further research should be done to expand on the application of market research models given a good with specified set of characteristics.

In this study, the researcher demonstrated how the taxonomy helped to focus buyers' attention on market research activities to utilize, given a good with a specified set of characteristics. An analysis of the respondents' answers revealed a high degree of commonality among several of the characteristics such that a simple model of recommended market research activities was proposed. Additionally, the process revealed market research activities that should be used and were not. A further study should be conducted using other sets of specified characteristic profiles to see if similar patterns develop that may prove useful in developing market research models for Federal Government buyers.

4. A study should be conducted on whether a taxonomy can and should be developed for the purpose of conducting market research.

This research demonstrated some of the difficulties which are being experienced by Government buyers in the area of market research and it also demonstrated the useful application of the Wenger taxonomy to market research. Some of the difficulties experienced by the buyers are the result of a lack of a formal structure to focus and assist the buyer in the conduct of market research. Since a taxonomy provides an organized and systematic manner to develop a body of knowledge in an area, its ability to provide focus and

structure to market research warrants further examination.

The increased emphasis on effective market research in Government procurement today, and as well as in the future, will challenge the acquisition workforce significantly. The increased importance of market research in the future may therefore warrant the development of a taxonomy, specifically for the purpose of conducting market research.

F. SUMMARY

This chapter presented the conclusions and recommendations from the study. Answers to the primary and secondary research questions were presented as well. The researcher also made recommendations for areas for further research as a result of this study.

APPENDIX

Dear _____,

My name is Lieutenant John F. Lynn and I am a student at the Naval Postgraduate School in Monterey, California. I am contacting you to ask your assistance in obtaining data for my thesis research. I am using a survey to be followed by an interview to gather the necessary data. My thesis is entitled "Application of a Taxonomical Structure for Classifying Goods Purchased by the Federal Government to the Market Research Function."

My objective is to examine the concept of contracting as a science. Within that framework, I am examining the relationship between a good's characteristics and the conduct of market research. At the completion of the research, I hope to be able to construct a model that will help show what market research activities are required to ensure "full and open" competition, given a good's characteristics. It is hoped that this study will help to simply the market research function and produce a simple model to guide the decision process for front-line buyers.

One of the important aspects of my research is the generation of the characteristics by which the good is to be classified. Previous research efforts have identified 6 primary attributes with 5 levels each, as shown in enclosure (1). Though goods can certainly possess more than just these six characteristics, the previous research efforts found these six to be the most mutually exclusive and collectively exhaustive. It is for those reasons that this research is limited to an examination of these six primary attributes.

A second important step is to have buyers prioritize the characteristics as they relate to the market research function. In other words, in rank order, which characteristics would be most beneficial to performing market research.

For the purposes of this survey, market research is defined to be ... "the intellectual effort on the part of purchasers to ascertain in advance, on the basis of factual information and data, what the response of a supplier or industry will be to an offer to buy and, what performance can be expected if a contract is formed."

I ask that buyers in your organization classify the goods listed in enclosure 2 according to the scheme of enclosure 1. The goods listed on the survey are common components found on the H-60/SH-60B Blackhawk/LAMPS MK III aircraft. The survey

may take each buyer approximately 30 minutes to complete. Additionally, please have the buyers complete the questions in enclosure 4. For purposes of this survey, it is not necessary that a buyer may or may not have purchased the goods. As long as the buyers have a working knowledge of the components and can visualize the goods in their "mind's eye" will suffice. I would greatly appreciate it if the surveys could be completed and returned by 03 October in the enclosed self addressed envelope.

After the surveys have been returned and the data has been analyzed I would like to interview you and get your thoughts on the results. Therefore I would like to call you the week of 10 - 14 October and arrange a convenient time to conduct a telephone interview. The interview will focus on those questions in enclosure 4 as well as the empirical results of the surveys.

I thank you for your assistance with my research and look forward talking to you in the near future.

Sincerely,

JOHN F. LYNN
LT, SC, USN

CHARACTERISTICS ASSOCIATED WITH
GOVERNMENT GOODS

1.   **Complexity** describes the good's technical intricacies. The degree of a good's technical complexity may be thought of in terms of the skill and expertise needed to produce the good.   Another way to determine complexity is whether the good is a system, sub-assembly, component, piece part or raw material.   For scoring purposes, 1 indicates little or technological complexity, with 5 being very high complexity.

SCALE
1   Very low technical complexity
2   Low technical complexity
3   Medium technical complexity
4   High technical complexity
5   Very high technical complexity

2.   **Customization** is the degree to which the good is manufactured to the buyer's specifications. Some goods, those that are strictly commercial, have no amount of customization, while others are produced exclusively for a buyer, e.g. the Government. Goods that are not customized should be scored 1, while those developed exclusively for the Government should be scored 5.

SCALE
1   No amount of customization
2   Low degree of customization
3   Medium amount of customization
4   High amount of customization
5   Made exclusively for the Government

3.   **Maintainability** refers to the amount of maintenance considerations associated with the good.   In other words, how frequently, if at all, is maintenance required on the good. Some goods are virtually maintenance-free while others require a great deal of maintenance throughout their life cycle.

SCALE
1   No maintenance required
2   Low maintenance requirements
3   Medium maintenance requirements
4   High maintenance requirements
5   .   Very high maintenance requirements

4. **Unit cost** is the good's cost to the buyer. Generally speaking, as a good becomes more unique to the buyer's requirement, the unit cost increases. To score, use 1 for low unit cost and 5 for very high unit cost.

SCALE

1	Very low unit cost
2	Low unit cost
3	Medium unit cost
4	High unit cost
5	Very high unit cost

5. **Documentation** is a characteristic external to the good yet many times a necessary part of the good. Frequently the Government requires substantiating documentation in the form of drawings, technical manuals, and certifications for some types of goods, while for others little, if any at all, is required. When scoring, a 1 would indicate a good purchased with no accompanying documentation while 5 is for those goods accompanied by drawings, technical manuals, etc.

SCALE

1	No associated documentation
2	Low amount of documentation
3	Medium amount of documentation
4	Great deal of documentation
5	Very high amount of documentation

6. **Item attention** given by the buyer refers to single-item versus volume or mass buying. When a buyer deals with small dollar-value items like common bolts and rivets, the focus is on a mass quantity of these types of goods. Contrast this the acquisition of a F-14 aircraft where the buyer's attention is focused on a single item.

SCALE

1	Complete volume-type attention
2	Mostly volume-type attention
3	Good that could be either volume or single item
4	Good that is usually single-item attention
5	Good that is always single-item attention

GOODS AND CHARACTERISTICS

GOODS \ CHARACTERISTICS	1. COMPLEXITY	2. CUSTOMIZATION	3. MAINTAINABILITY	4. UNIT COST	5. DOCUMENTATION	6. ITEM ATTENTION	7. CHARACTERISTICS' PRIORITY FOR MARKET RESEARCH	8. COMMENTS
(SAMPLE) GYROSCOPE, RATE	3	3	3	3	4	4	1,6,5,2,3,4	
1. REARVIEW MIRROR								
2. T700 GE 401 ENGINE								
3. PILOT'S CYCLIC STICK								
4. ANTI-COLLISION LIGHT LENS								
5. AUXILIARY POWER UNIT								
6. TIP CAP, BLADE								
7. STABILATOR, TAIL								
8. MAIN ROTOR								
9. RUDDER CONTROL PEDAL								
10. RIVET, AIRFRAME								
11. RESCUE HOIST								
12. STARTER, ENGINE								
13. BLADE, TAIL								
14. TIRE, FWD WHEEL								
15. SHOCK, STRUT ASSY								
16. LINK ASSY, TAIL								
17. SEAT, AIRCRAFT, PILOT								
18. CIRCUIT CARD ASSY								
19. SERVO VALVE, HYDRAULIC								
20. ELECTRONIC COMPASS								

ENCLOSURE (2)

INSTRUCTIONS TO COMPLETE SURVEY

1. Using the descriptive characteristics and their respective scales (enclosure 1), classify the 20 goods listed on enclosure 2 according to those criteria. It is not important whether or not you have purchased the particular item. As long as you possess a working knowledge of the nature of the item will suffice.

2. For each Good fill in each characteristic block with a number corresponding to the scale value. (See sample entry for Steam Turbine)

3. For each Good, put the 6 characteristics in rank order of importance for conducting market research. (See block 7 for sample on Steam Turbine)
Note: A higher scale value (such as those for characteristics 5 & 6 in the sample entry) does not necessary correlate to order precedence or a higher priority.

4. Feel free to write any comments that may clarify your rankings and/or classifications. Items that you feel are worthy of further consideration are appreciated.

5. Please answer the questions at the end of the survey. Some are general in nature, while others ask your thoughts about market research in relation to the classification scheme. Please be forthright.
   This survey is intended to demonstrate the usefulness of the classification at the buyer/practitioner level. Your inputs are critical.

Enclosure (4)
QUESTIONS TO ACCOMPANY SURVEY

This survey is being conducted to examine the relationship between a good's characteristics and their importance to conducting market research. For purposes of this study, market research pertains to those activities which are conducted in order to ascertain in advance, (1) conditions in the market place, (2) knowledge of current technology and trends, and (3) to help develop competitive solicitation strategies.

In conjunction with your classification of the goods in enclosure (2), please take a few moments to answer the following questions as they pertain to market research.

1. The Competition in Contracting Act (CICA) and the FAR mandate that market research in conjunction with acquisition planning be conducted in every procurement, please provide, in your own words, a brief definition of market research.

_____
_____
_____
_____

_____

2. What are the most frequently used market research activities in which you regularly engage in your organization in order to meet the legislative requirement? (e.g., synopsize in CBD, consult trade association journals or pubs, contact vendor sales personnel, etc.)

_____
_____
_____
_____
_____
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_____

3. Which of the 6 characteristics of a good, from this survey, are the most important for market research purposes to you and why?

_____
_____
_____
_____
_____

_____

4. For that most important characteristic from Question 3, what market research activities, (based on your experience), should be engaged in, to ensure full and open competition?

_____
_____
_____
_____
_____

5. Now that you have completed the characteristics scheme of enclosure (2), do you feel that this process has application to the procurement process? (circle one)   Yes
        No
6. If so, in what ways or if not, why not? Please discuss.

_____
_____
_____
_____
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_____

7. If your were to complete an exercise like this for a certain good, do you feel the process would help you in performing your market research? If so, please discuss.

_____
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_____
_____
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_____

8. Do you see any other benefits of applying a classification scheme, like this survey, for classifying goods and their characteristics to the market research function?

_____
_____
_____
_____
_____

9. Additional comments.   .

_____
_____
_____
_____
_____
_____

10. The following table is a list of widely accepted market research activities. Please indicate with a check mark, six activities within each of the characteristic's columns that are the most significant in terms of market research. If an activity is not listed, please list that activity under, Other. The characteristics columns are as follows;

Column Headings:
C1 = High Degree of Complexity, Level 5
C2 = High Degree of Customization, Level 5
C3 = High Degree of Maintainability, Level 5
C4 = High Unit Cost, Level 5
C5 = High Amount of Documentation, Level 5
C6 = High Degree of Item Attention, Level 5

	Source of Market Information	Characteristics					
		C1	C2	C3	C4	C5	C6
1	*Commerce Business Daily* Synopsis						
2	Draft Solicitations						
3	Bidders' Conferences						
4	Trade Journals/Articles						
5	Industrial Advertisements						
6	U.S. Dept. Of Commerce Pubs						
7	*U.S. Industrial Outlook*						
8	Market Surveys						
9	Market Investigations						
10	Procurement History Files						
11	Vendor Sales Personnel						
12	Vendor Technical Personnel						
13	Trade Association Directories						
14	Vendor Site Surveys						
15	Attend Trade & Associations Shows						
16	NCMA/NAPM Journals/Contacts						
17	Vendor Catalogs/Product Brochures						
18	GSA/Federal Schedules						
19	Newspaper/Magazine Advertisements						
20	Federal Procurement Data System(FPDS)						
21	Other Shared Databases						
22	Purchasing Personnel in other Departments/Organizations						
23	Corporate Annual Reports						
24	Consultants						

25	Yellow Pages						
26	Other						
27							
28							

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LIST OF INTERVIEWEES

Beck, Dr. Alan W., Professor, Defense Systems Management College, Fort Belvoir, Virginia.

Coates, Elinor Sue, Consultant, Coates & Company, San Francisco, California.

Foley, Joe, Senior Procurement Specialist, H-60 Business Unit, U.S. Navy Aviation Supply Office, Philadelphia, Pennsylvania.

Haugh, LeRoy, Vice President, Aerospace Industries Association of America, Inc., Washington, D.C.

Hearn, Dr. Emmett, Instructor, University of California at Berkeley, Berkeley, California.

Lehman, Ms. Carol, Division Chief, H-60 Procurement Branch, U.S. Army Aviation Troop Command, St. Louis, Missouri.

Lessig, Dr. James B., Vice President, Logistics Management Institute, McLean, Virginia.

Macfarlan, W. Gregor, Logistics Management Institute, McLean, Virginia.

Prendergast, John J., CDR, SC, USN, Director, Industrial Support Branch, U.S. Navy Aviation Supply Office, Philadelphia, Pennsylvania.

Swanson, Joel, Senior Buyer, United Technologies Sikorsky Aircraft, Stratford, Connecticut.

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